S. HRG. 102-30

ALTERNATIVE FUEL FLEETS

(Title VII of S. 570)

HEARING

BEFORE THE

COMMITTEE ON ENERGY AND NATURAL RESOURCES UNITED STATES SENATE

ONE HUNDRED SECOND CONGRESS

FIRST SESSION

ON

S. 570

TO IMPLEMENT THE NATIONAL ENERGY STRATEGY, AND FOR OTHER PURPOSES

MARCH 20, 1991

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ALTERNATIVE FUEL FLEETS

(Title VII of S. 570)

WEDNESDAY, MARCH 20, 1991

U.S. SENATE,
COMMITTEE ON ENERGY AND NATURAL RESOURCES,
Washington, DC.

The committee met, pursuant to notice, at 2 p.m., in room SD-366, Dirksen Senate Office Building, Hon. J. Bennett Johnston, chairman, presiding.

OPENING STATEMENT OF HON. J. BENNETT JOHNSTON, U.S. SENATOR FROM LOUISIANA

The CHAIRMAN. The committee will come to order.

This afternoon, we turn our attention from CAFE to alternative fuels, from making gasoline vehicles more efficient, to finding substitutes for gasoline. The administration has proposed requiring fleet owners in most urban areas to buy alternate fuel vehicles. Our hearing will focus on the administration proposal, which is found in title VII of S. 570. Senator Wallop and I did not include a fleets provision in our bill.

Alternative fuels offer great promise. There is no question that alternative fuels can work. Small demonstration projects across the country have proved it. The difficulty lies in breaking into the marketplace.

The public will not buy alternative fuel vehicles until they are confident that they can find alternative fuels as readily, as conveniently, and as cheaply as they can find gasoline. The auto makers and the fuel distributors will not invest in the necessary infrastructure until they are assured a market.

The administration proposes to cut this Gordian knot. It would have us require fleet operators in most urban areas to buy alternative-fuel vehicles. The administration assumes the auto makers and the fuel distributors will move quickly to supply the captive market created by the legislation.

I am in full agreement with the administration's motives on this issue. The use of alternative-fuels vehicles holds great promise for reducing our Nation's oil consumption. Clearly Federal help is needed if alternative fuels are to penetrate the market and reshape our transportation system.

I think the administration has the right goal. The question is whether the administration has chosen the best way to reach that goal. Does it try to go too far, too fast? Does it put too heavy a

burden on the businesses that would have to buy and use these vehicles?

The proposal before us today is not like the fleet's provision in the Clean Air Act Amendments. The Clean Air Act affected less than 2 dozen of our biggest cities. This proposal would affect 43 of the 50 States. It would affect cities and suburbs holding two-thirds of our population. It would affect the way goods and services are delivered and the price we pay for them.

When the President unveiled his National Energy Strategy he was widely criticized for not being bold. In some areas, that criticism was warranted. Here, it is not warranted. The President's fleet provision is bold, and that, I guess, is good. The purpose of our hearing will be to look at the strengths and weaknesses of the administration's proposal.

[The prepared statement of Senator Wallop and the text of title VII of S. 570 follow:]

PREPARED STATEMENT OF HON. MALCOLM WALLOP, U.S. SENATOR FROM WYOMING

Mr. Chairman, as I stated at the Committee's earlier transportation hearing,

> It is not possible to talk about a comprehensive national energy strategy without also talking about national transportation practices. Our country's economic vitality is dependent on the efficient transportation of people, goods and services. Yet the very dependence of our transportation on oil jeopardizes our national security and, in turn, the economic and social vitality of our Nation.

As an alternative to more stringent CAFE standards, the Administration proposed to expand on the alternative fuels provisions contained in the 1990 Clean Air Act Amendments. Because of concern for public health in 22 non-attainment areas in 20 States, last year the Congress decided to intervene in the market place and mandate the conversion of certain fleet vehicles to alternative fuels.

Before even testing the new Clean Air Act's alternative fuels and fleet programs, the Administration proposes to expand these program both within these 22 areas to fleets of 10 or more vehicles and nation-wide to any fleet owners with 20 or more vehicles. Their expanded proposal would encompass approximately 130 cities, where two-thirds of all Americans live.

Once again the Federal government proposed to substitute its judgment for that of industry in deciding what technologies are feasible. Common sense would suggest the advisability of some experience with the 22 non-attainment areas where public health was at risk before further intervention in the market place. By the expansion of this as yet untested program we may well jeopardize achievement of the very public health objectives sought by the Clean Air Act.

I am concerned that before Federal policies expand the use of alternative fuels we need to fully understand the consequences for fuel producers, fuel marketers, the affected fleet operators, and public health and safety. For example, we need know for which alternative fuels there exists a distribution system and for which a system needs to be created? We also need to know which alternative fuels add to the weight of vehicles and thus affect safety? Which alternative fuels reduce the high standard of mobility on which our economy relies for the movement of people, goods and services? Which alternative fuels actually reduce energy efficiency by requiring more Btu's per mile driven? And, which alternative fuels increase our dependence on foreign energy supplies?

For example, if imported methanol is simply substituted for imported crude, very little is accomplished for national security. However, today domestically produced natural gas liquids do not have equal access to transportation markets as an alternative fuel as does methanol, ethanol, natural gas and electricity. This disparity should be corrected in any action by the Committee on alternative fuels for both existing and future national programs.

My State of Wyoming is one of the largest producers of natural gas and natural gas liquids. Wyoming annually produces about 88 million gallons of propane out of 16.8 billion gallons produced nationally. While propane contains only 85 percent the Btu content of gasoline, compared to other so-called "alternative fuels", it has 121 percent the Btu content of ethanol, which is subsidized; 157 percent that of metha-

nol, which will be imported, and almost 400 percent that of CNG (compressed natural gas).

Finally, I find it interesting that after an almost 40 year effort to remove Federal regulation of the natural gas, some of the same interests who supported that deregulation effort are now supporting regulation of its use. I wonder what will happen when the national demand for natural gas exceeds supply: which users are going to be curtailed?

I anticipate that the alternative fuel provisions of S. 570 will stimulate detailed comments by all interested parties. I would be particularly interested in hearing about alternatives that would place greater reliance on market incentives and less emphasis on regulatory and tax subsidies to achieve the same outcome.

Thank you, Mr. Chairman.

II

102D CONGRESS
1ST SESSION

S. 570

To implement the National Energy Strategy, and for other purposes.

IN THE SENATE OF THE UNITED STATES

MARCH 6 (legislative day, FEBRUARY 6), 1991

Mr. JOHNSTON (for himself and Mr. WALLOP) (by request) introduced the following bill; which was read twice and referred to the Committee on Energy and Natural Resources

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A BILL

To implement the National Energy Strategy, and for other purposes.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That this Act may be cited as the "National Energy Strategy Act".

* * * * * * *

TITLE VII—ALTERNATIVE FUEL

Subtitle A—Alternative and Dual Fuel Vehicle Credits

Alternative and Dual Fuel Cap Removal

SEC. 701. Section 513 of the Motor Vehicle Information and Cost Savings Act (15 U.S.C. 2013) is amended to read as follows:

"CONSIDERATION OF CERTAIN AUTOMOBILES

"Sec. 513. In carrying out section 2002(a)(4) and (f) of this title, the Secretary shall not consider the fuel economy of alcohol powered automobiles or natural gas powered automobiles, and the Secretary shall consider dual energy automobiles and natural gas dual energy automobiles to be operated exclusively on gasoline or diesel fuel.".

Subtitle B—Alternative Transportation Fuels Definitions

SEC. 711. For the purposes of this subtitle—

(1) "alternative fuel" means methanol, ethanol, and other alcohols; mixtures containing 85 percent or more by volume of methanol, ethanol, or other al-

cohol with gasoline or other fuels; natural gas; liquid petroleum gas; hydrogen; and electricity;

(2) "alternative fuel vehicle" means a motor vehicle that—

(A) operates solely on alternative fuel, or

(B) is a flexi-fueled vehicle;

(3) "covered person" means a person to whom section 712 of this subtitle applies;

(4) "fleet" means a number of motor vehicles, all or a part of which are centrally fueled or capable of being centrally fueled, that are owned, operated, leased, or otherwise controlled by a person. This term does not include—

(A) motor vehicles held for daily lease or rental to the general public;

(B) motor vehicles held for sale by motor vehicle dealers, including demonstration vehicles;

(C) motor vehicles used for motor vehicle manufacturer product evaluations or tests;

(D) law enforcement vehicles;

(E) emergency vehicles;

(F) military tactical vehicles; or

(G) nonroad vehicles, including farm and construction vehicles;

(5) "flexi-fueled vehicle" means a motor vehicle that can operate on alternative or nonalternative fuel;

(6) "person" has the meaning given that term in section 1 of title 1, United States Code, but also includes a State government and a local government;

(7) "Secretary" means the Secretary of Energy; and

(8) "urban bus" has the meaning given that term in section 219 of the Clean Air Act (42 U.S.C. 7554).

ACQUISITION OF ALTERNATIVE FUEL VEHICLES

SEC. 712. (a)(1) This subsection applies to a person who owns, operates, leases, or otherwise controls a fleet that—

(A)(i) contains at least—

(I) ten automobiles;

(II) ten trucks, except multi-unit trucks over 26,000 pounds gross vehicle weight; or

(III) ten buses, except intercity passenger buses and urban buses; or

(IV) a combination of at least ten motor vehicles of these types; and

(ii) is located in a metropolitan statistical area or consolidated metropolitan statistical area, as established by the Bureau of the Census, with a 1980

population of more than two hundred and fifty thousand which has been classified by the Environmental Protection Agency under part D of title I of the Clean Air Act as a serious, severe or extreme nonattainment area for ozone based on 1987, 1988, and 1989 data; or

(B)(i) contains at least—

(I) twenty automobiles;

(II) twenty trucks, except multi-unit trucks over 26,000 pounds gross vehicle weight;

(III) twenty buses, except intercity passenger buses and urban buses; or

(IV) a combination of twenty motor vehicles of these types; and

(ii) is located in any metropolitan statistical area or consolidated metropolitan statistical area, as established by the Bureau of the Census, with a 1980 population of more than two hundred and fifty thousand.

(2) When a person to whom this subsection applies under paragraph (1) purchases, leases, or otherwise acquired vehicles for the fleet described in paragraph (1), in the years specified in this paragraph, the following percentage of the vehicles purchased, leased, or otherwise ac-

quired shall be alternative fuel vehicles in the respective years—

(A) in 1995, 10 per centum;

(B) in 1996, 15 per centum;

(C) in 1997, 25 per centum;

(D) in 1998, 50 per centum;

(E) in 1999, 75 per centum; and

(F) in 2000 and afterwards, 90 per centum.

(b)(1) This subsection applies to a person who owns, operates, leases, or otherwise controls a fleet that—

(A)(i) contains at least ten urban buses, except intercity passenger buses, and

(ii) is located in an area described in subsection (a)(1)(A)(ii) of this section, or

(B)(i) contains at least twenty urban buses, except intercity passenger buses, and

(ii) is located in an area described in subsection (a)(1)(B)(ii) of this section.

(2) When a person to whom this subsection applies under paragraph (1) purchases, leases, or otherwise acquires vehicles for the fleet described in paragraph (1), in the years specified in this paragraph, the following percentage of the vehicles purchased, leased, or otherwise acquired shall be alternative fuel vehicles in the respective years—

(A) in 2000, 50 percent;

(B) in 2001, 75 percent;

(C) in 2002, 80 percent; and

(D) in 2003 and thereafter, 90 percent.

EXCEPTION

SEC. 713. This subtitle does not apply to a covered person if the Secretary determines that no alternative fuel vehicles meeting the fleet requirements for that person are available for purchase, lease, or acquisition by other means when the subtitle becomes applicable to the covered person. This subtitle applies to that covered person when alternative fuel vehicles become available. This subtitle does not apply to a person subject to section 712(b) if the Secretary determines that no alternative fuel vehicle that is an urban bus complies with the warranty standards for urban buses.

CREDITS

SEC. 714. (a) The Secretary shall allocate a credit to a covered person if that person purchases an alternative fuel vehicle in excess of the number that person is required to purchase under this subtitle or purchases an alternative fuel vehicle before the date that person is required to purchase an alternative fuel vehicle under this subtitle.

(b) In allocating credits under subsection (a), the Secretary shall allocate one credit for each alternative fuel vehicle the covered person purchases that exceeds the

number of alternative fuel vehicles that person is required to purchase under this subtitle or that is purchased before the date that person is required to purchase an alternative fuel vehicle under this subtitle. The credit shall be allocated for the same type of vehicle, including an urban bus, automobile, or other vehicle subject to the requirements of this subtitle, as the excess vehicle or earlier purchased vehicle.

(c) At the request of a covered person allocated a credit under this section, the Secretary shall treat the credit as the purchase of one alternative fuel vehicle of the type for which the credit is allocated in the year designated by that person when determining whether that person has complied with this subtitle in the year designated. A credit may be counted toward compliance for only one year.

(d) A covered person allocated a credit under this section or to whom a credit is transferred under this section, may transfer freely the credit to another person who is required to comply with this subtitle. At the request of the person to whom a credit is transferred, the Secretary shall treat the transferred credit as the purchase of one alternative fuel vehicle of the type for which the credit is allocated in the year designated by the person to whom the credit is transferred when determining whether that

person has complied with this subtitle in the year designated. A transferred credit may be counted toward compliance for only one year.

REPORTS

SEC. 715. The Secretary may require a person to file with the Secretary the reports the Secretary determines necessary to implement this subtitle.

ENFORCEMENT

SEC. 716. (a) A person who violates a requirement or prohibition of this subtitle is subject to a civil penalty of not more than $100,000 per violation. Each month in which a violation occurs constitutes a separate violation, unless the violator establishes that the vehicle necessary to comply with this subtitle could not be purchased, leased, or otherwise acquired in that month. The first month of a violation of the yearly acquisition requirements of section 712 is the month in which a person purchases, leases, or otherwise acquires vehicles that result in noncompliance with the yearly alternative fuel vehicle purchase requirement under that section. Each month in which compliance has not been achieved after the first month is a separate violation.

(b) The Secretary may request the Attorney General to commence a civil action for a permanent or temporary injunction or to assess and recover any civil penalty under subsection (a) of this section. An action under this sub-

section may be brought in the district court of the United States for the district in which the violation is alleged to have occurred or in which the defendant resides or has his principal place of business. The court in which the action has been brought may restrain a violation, require compliance, assess a civil penalty, collect any noncompliance assessment and nonpayment penalty owed the United States, and award any other appropriate relief. In such an action, subpoenas for witnesses who are required to attend a district court in any district may run into any other district.

(c)(1) Instead of commencing a civil action under subsection (b), the Secretary may assess an administrative penalty in the amount prescribed in subsection (a) of this section. The maximum amount of penalty sought against each violator in a proceeding under this subsection may not exceed $200,000, unless the Secretary and the Attorney General jointly determine that a larger amount is appropriate. A determination by the Secretary and the Attorney General on the appropriateness of a larger amount is not subject to judicial review.

(2) The Secretary shall assess an administrative penalty under this subsection by an order made on the record after opportunity for a hearing in accordance with sections 554 and 556 of title 5 of the United States Code. Before

issuing such an order, the Secretary shall give to the person to be assessed an administrative penalty written notice of the Secretary's proposal to issue an order. That person has 30 days from the date the notice is received to request a hearing on the order. The Secretary shall issue rules for procedures for hearings under this subsection. The Secretary may compromise, modify, or remit, with or without conditions, an administrative penalty that the Secretary imposes under this subsection.

(3) An order issued under this subsection becomes final 30 days after its issuance unless a petition for judicial review is filed under paragraph (4).

(4) Within 30 days following the date an administrative penalty is issued under this subsection, a person against whom the administrative penalty is assessed may seek review of the assessment in the United States District Court for the District of Columbia or for the district in which the violation is alleged to have occurred, the person resides, or the person's principal place of business is located. That person shall send a copy of the filing seeking review by certified mail to the Secretary and the Attorney General on the day of the filing. Within 30 days of the date the Secretary receives a copy of the filing, the Secretary shall file in the court a certified copy, or certified index, as appropriate, of the record on which the order

was issued. The court shall not set aside or remand the order unless there is not substantial evidence in the record, taken as a whole, to support the finding of a violation or unless the Secretary's assessment of the penalty constitutes an abuse of discretion. In a proceeding under this subsection, the United States may seek to recover administrative penalties assessed under this subsection.

(5) If a person fails to pay an assessment of an administrative penalty imposed by the Secretary under this subsection—

(A) after the order making the assessment has become final, or

(B) after a court in an action brought under paragraph (4) has entered a final judgment in favor of the Secretary,

the Secretary shall request the Attorney General to bring a civil action in an appropriate district court to recover the amount assessed, plus interest at rates established under section 6621(a)(2) of the Internal Revenue Code of 1986 from the date of the final order or the date of the final judgment, as the case may be. In this action, the validity, amount, and appropriateness of the penalty is not subject to review. A person who fails to pay on a timely basis the amount of an assessment of an administrative penalty under this section shall be required to pay, in addi-

tion to the amount and interest, the United States' enforcement expenses, including but not limited to, attorneys fees and costs for collection proceedings, and a quarterly nonpayment penalty for each quarter during which the failure to pay persists. The nonpayment penalty shall be in an amount equal to 10 percent of the aggregate amount of that person's penalties and nonpayment penalties which are unpaid as of the beginning of the quarter.

(d) In determining the amount of a penalty to be assessed under this section, the Secretary or the court, as appropriate, shall take into consideration, in addition to other factors justice may require, the size of the business, the economic impact of the penalty on the business, the violator's full compliance history and good faith efforts to comply, the duration of the violation as established by any credible evidence, payment by the violator of penalties previously assessed for the same violation, the economic benefit of noncompliance, and the seriousness of the violation.

IMPLEMENTATION

SEC. 717. The Secretary of Energy shall issue regulations to implement this subtitle.

* * * * * * *

The CHAIRMAN. We begin today with our colleague, Jim Jeffords, from the State of Vermont, who has given a lot of thought and effort to this. Senator Jeffords, thank you for appearing before us.

STATEMENT OF HON. JAMES M. JEFFORDS, U.S. SENATOR FROM VERMONT

Senator JEFFORDS. Thank you, Mr. Chairman, and it is a pleasure to be here. I am excited about the possibilities that I see for solving some of the problems that you mention in your statement. First of all, I would like to make my entire statement and some attachments a part of the record.

The CHAIRMAN. Without objection.

Senator JEFFORDS. What I am trying to do is to provide that kind of flexibility that we need to get us to a position where we can be energy independent. We have the resources to do it. We just need to develop the commercial ability to do it.

First of all, I would point out that I have visited with seven members of your committee, and those that I have visited with are all co-sponsors of this bill. I will give you their names, or let them confess to that themselves. Also Jim McClure, your ranking member last year, the last act he did before he left the Congress was to co-sponsor a bill almost identical to the one I have here.

Let me start just by going through the concept that we are dealing with and just point to a very familiar chart to you, I am sure, as to what happened in the mid-1970's, and what happened there, obviously, we had a $50-a-barrel cost, and the enthusiasm for alternative fuels was wide, and synthetic fuels, and we developed a synfuels program. Then, lo and behold, of course, wham, the price dropped, and plummeted down to around the area of $20 a barrel, and the synfuels program went down in flames.

How do we solve that problem, the problem of ensuring that we can attract the capital necessary to develop the alternative fuels necessary in order to get us energy independent? What we do in our bill is to provide a definite, separate market for replacement—we call them replacement fuels, those that will take the place of gasoline; and alternative fuels, which are independent from the price of oil but subject to competition among the various alternatives.

In other words, we let the market solve the problem of what those alternatives will be, but we do not let the solution be dictated by the price of oil.

In the bill, the replacement fuel is a fuel, as I said, that replaces gasoline, and the alternative fuels are things which operate in different kinds of engines. We try to do that because we recognize there is going to be millions of automobiles with gasoline engines around for decades to come. We have to do something with them which also will get us to that major goal.

Secondly, this bill that we have is compatible with your bill, it is compatible with the administration's bill, it does not fight with anyone, it just gives the market solutions to the problems that we face. But in addition to that it is the only one, by requiring an increasing percentage each year after we start, to break into this market. In other words, we start out with a small market of what-

ever it will be—1, 2 percent, and then we keep going up and we give discretion as we go along to the Secretary to adjust the percentages to meet the capacity to fill those percentages.

But it is the only one, as you can see from this chart here—the Replacement Alternate Fuel Act, RAFA. Sounds more like the beginning of a song. What it will do is, one, it will bring along all the alternative fuels parts of the national energy strategy of the administration, and your bill.

It will give you the insurance policy to make sure that those things work, and in addition to that, it will, by the way we have designed this, end up with an additional 3.6 million barrels a day being utilized towards energy independence. It is the only one which has a line that points towards total energy independence.

What we see is that when we reach the year 2010, we will have developed the commercial ability to be able to say, okay, let us go for it all, and then we can reach that energy-independent status.

Let us go to the next chart. What the program tries to do, basically, is we have a target of 10 percent replacement fuels or alternative fuels by 1998. We then go to 30 percent by 2010.

But also, we provide flexibility in a number of ways, but one of those is to have a market credit system similar to what we developed in the clean air bill, and I got these ideas from my work on the clean air bill, to provide refiners and suppliers with alternatives.

They can mix themselves, they can buy gasoline provided from coal or methanol or ethanol, whatever else. They can do that, or they can buy a market credit from another refiner who wants to do more than the 1 or 2 percent which is required. Or they can work with a distributor to purchase a market credit from them to provide capital to increase and to expand the distribution system of such things as methanol or CNG, or whatever else, to try and complement and to help bring along the kind of distribution system which is necessary in order for us to get out of the chicken-and-egg problem that we have right now, where we can provide the cars but we do not have the distribution system to give them the fuel.

In addition, it is completely compatible with the Clean Air Act, and it will ensure compliance on a much quicker path than the clean air bill otherwise would provide. California loves it. They see this as a big hope of getting on schedule and ahead of schedule as quick as possible.

Let us go to the next chart, the final one, and then I will go back in just a minute and explain how some of these things work.

What does it do to the consumer? Now, how do we make this bill—first of all, it costs nothing. It is not any drain on the budget. You do not have to worry about any budget costs, because what we do is to spread the cost over the total motor fuel market.

We do that by saying that everyone that is either supplying gasoline or refining it has to participate in the program. We have fines to assure compliance. Thus, by buying either the market credits or mixing they will spread the 1 percent cost over the rest of the 99 percent, or the 2 percent over the 99 percent.

Thus the cost per gallon, according—this is a DOE chart, incidentally. It is not mine. This is a DOE chart in which we are looking into a similar type of a program. It only goes under their scenarios

up to 2.5 cents a gallon, and then it can go all the way down to below the scale with the tremendous technology breakthroughs we are having right now in ethanol.

Now, what kind of fuels will come out of this? That, the market will decide, plus our environmental standards will make the decisions on that, but what it does is, it says the market shall decide what they are and what the least-cost options are.

What are the likely winners? In the short-run, we are going to have many winners in the sense of natural gas, we will have the methanol option, the ethanol option, we already have incentives for ethanol in there. All these things would be operable and would provide—there is no question in my mind, in the early part here——

The CHAIRMAN. Let me interrupt here, before I forget this. This is directed at refiners?

Senator JEFFORDS. It is directed at refiners and suppliers of gasoline.

The CHAIRMAN. If they do not have natural gas, and natural gas, as I understand it, would probably be the alternative fuel right now, as I understand the economics. What do refiners do that do not have natural gas?

Senator JEFFORDS. They would purchase a market credit from a supplier of CNG and help them design their distribution system in compliance—in California if it is there, or wherever else it is—so it would provide a source of capital to the CNG people to be able to provide the distribution system for CNG cars. Or they could be for methanol, flexi-fuel vehicles, or electric cars.

We just give a broad range, but they would have to purchase that, and then they would not have to mix. They can go right ahead doing their thing with reformulated gasoline, or other things we are requiring them to do.

The CHAIRMAN. What happens if the mandated amount does not match the market use? They mandate 10 percent and there are not enough cars out there to use it up?

Senator JEFFORDS. Well, the market will make those decisions by the skew of the alternate source chosen. For instance, there are methods out there now which I have looked at for the production of synthetic gasoline from coal, and some of them are perfectly clean technologies that could provide it, and the mix would skew toward the replacement side.

The CHAIRMAN. No, what I am saying is, suppose you mandate 10 percent and the market uses up only 5 percent? How do you adjust your system?

Senator JEFFORDS. There is authority in the Secretary to adjust.

The CHAIRMAN. In the Secretary?

Senator JEFFORDS. In the Secretary. He would adjust and say well, we are not going to make it, so we will lower the standards, we will lower the percentages, and thus we give full flexibility in that, although we are a little tougher in the initial stages in order to pull things along.

But we give flexibility to make sure that you do not get into that kind of position, especially because we do have sanctions in here and obviously you cannot sanction someone when you have not provided the methodology or the mechanism for them to be able to comply.

That is pretty much it, Mr. Chairman, except for one other thing. The other chicken-and-egg problem we try to deal with is the one which you have been looking into, I am sure, in CAFE standards. What we say is that one of our basic problems right now is, sure we can produce a lot of flexi-fuel vehicles, but suppose there is not any fuel to make them flexible? Well, that is why you have the Sharp-Rockefeller cap.

What we say is, okay, let us allow that cap to be lifted, but only to the extent that you can show an increased utilization of the fuel that is supposed to be used in flexi-fuel vehicle. And if you can show that half the cars are now using methanol as a flexi-fuel or whatever, fine, we drop the cap half-way, or whatever that would work out, so that we attract the automobile industry to say, hey, let us work with the alternative fuel side, let us work with the alternative fuel industry and develop the kind of distribution system which is necessary so we can get rid of this cap.

I personally, if you have a block-long limo that runs on ethanol, it does not bother me too much. If they want to do that it would give them pressure toward saying, hey, let us get some ethanol vehicles out here, or whatever else, and see what we can do. I pick on ethanol because it is the environmentally neutral fuel which will also be a tremendous boon to our agricultural side, and there is a very deep interest in the Department of Agriculture in this kind of concept which will pull ethanol along.

[The prepared statement of Senator Jeffords follows:]

PREPARED STATEMENT OF HON. JAMES M. JEFFORDS, U.S. SENATOR FROM VERMONT

Good afternoon, Mr. Chairman. I appreciate this opportunity to testify before the Energy Committee.

Mr. Chairman, this Committee has a full slate of issues to deal with in developing a consensus on national energy strategy. While I am also interested in utility, commercial and residential issues, today I want to focus on the transportation sector.

It is the transportation sector which is 95% dependent on oil as its fuel. It is the transportation sector which consumes over 60% of all oil in this country.

Along with seven Members of this Committee, I have introduced a bill directed at increasing the use of domestic, non-petroleum fuels in the transportation sector.

Other proposals that have been introduced simply do not get the job done. I do not mean to be critical, because I was part of the last year's negotiations on the Clean Air Act, where we found out how tough it is for motor vehicles to kick the gasoline habit. I support fleet provisions, reformulated gasoline requirements and other incentives, but we need to go further.

We need to take strides to move away from imported oil dependence. The OPEC nations simply have too much of an ability to manipulate the price of oil—toward the high end to strangle our consumers, or toward the low end to strangle entrepreneurs who would challenge OPEC's reign.

My proposal would reserve a portion of the total motor fuel market for domestic, non-petroleum fuels. These candidate fuels would then compete against one another, under market conditions, but independent of the volatile price of gasoline. The bill establishes a market credit system for these fuels to encourage the least-cost solutions.

Under this program, gasoline manufacturers would be required to dedicate a fixed percentage of their production capacity to domestic, non-petroleum resources. A refiner may choose to meet its requirements within its own product mix or through arrangements with other fuel providers.

My goal is to provide a definite, separate market—operating independently of the volatile price of oil—for replacement and alternative fuels. The bill defines "replacement fuels" as those capable of being mixed with gasoline and used in present gasoline engines. "Alternative fuels" are those not compatable with gasoline, for which distinct combustion engines are required. The market share for these fuels would go

from the current one or two percent to a target of 30% of all motor fuels by the year 2010.

Under this plan, no special governmental subsidies are required. The marginal cost is spread over the entire motor fuel market, resulting in low consumer costs. As the price of oil rises over time, the cost differential disappears.

This program provides an "insurance policy," ensuring the effectiveness of the various alternative fuels initiatives in place or proposed under other energy plans. It is entirely consistent with all such programs we have seen.

Addressing the so-called "chicken and egg" dilemma between alternative fuels and vehicles, the bill proposes to lift the existing cap on CAFE credits for manufacturers of dual-fueled or dedicated-fuel vehicles, but only to the extent that sales of alternative fuels indicate that such fuels are displacing imported oil.

It builds upon measures enacted under the Clean Air Act, serving to accelerate the availability of cleaner fuels nationwide.

By encouraging domestic fuels, we help improve our trade inbalance, and fuel the economy with billions of investment dollars here at home.

This is the only program I have seen which can put us in a position to achieve energy independence after 2010. By allowing maximum flexibility in meeting the targets, efficient technologies and least-cost methodologies will be proven.

Thank you, Mr. Chairman. I would be pleased to answer any questions the Committee may have.

[Attachments.]

REPLACEMENT AND ALTERNATIVE FUELS ACT

1. Provides a definite separate market for replacement and alternative fuels independent from the price of oil, but subject to competition among the various alternatives. In the bill a replacement fuel "is a fuel which can be mixed with gasoline and used in present gasoline engines." This independent market share would go from 1% up to 30% of all motor fuels in 2010.
2. Creates no governmental subsidies and spreads the marginal cost over the entire motor fuels market resulting in low, and eventually, according to DOE, no increase in consumer costs.
3. Provides an "insurance policy" to the various alternative fuels policies in other national energy proposals. It is compatible with all such programs that we have seen.
4. Provides incentives to solve "the chicken and egg" problem between alternative fuel producers and auto manufacturers by lifting the CAFE cap, but only to the extent use of alternative fuels have increased in flexi-fueled vehicles.
5. It is compatible with, and will enhance the clean air act goals.
6. Reduces the balance of trade deficit and fuels the economy at home with billions in investment.
7. It is the only program that will provide the nation with the option to go to energy independence expeditiously after 2010. The least cost technologies and production methodologies to get there will be proven.

"REPLACEMENT AND ALTERNATIVE FUELS ACT OF 1991"

SUMMARY

Section 1: Title: "Replacement Fuels & Alternative Fuels Act of 1991."

Section 2: Findings: Need for national energy strategy that utilizes domestic resources competing under market conditions.

Section 3: Purpose: To enhance energy security and reduce air pollution, and for other purposes.

Section 4: Definitions:

Alternative Fuel: motor fuel not designed to be mixed with gasoline, including propane, natural gas, "neat" alcohol, hydrogen and electricity.

Replacement Fuel: motor fuel capable of being mixed with gasoline, including alcohol and liquids not derived from conventional petroleum.

Section 5: Program:

Secretary of Energy shall establish program to replace gasoline with the maximum mount of replacement and alternative fuels.

Targets: 10% replacement by 1998; 30% replacement by 2010.

Credit trading: Allowed between refiners of gasoline and distributors of alternative fuels.

Reporting: Required by refiners, distributors, and manufacturers of vehicles.

Exemptions: Deadline extension allowed for small refiners of domestic oil, and on a case-by-case basis. Year 2010 target may be adjusted by the Administrator.

Section 6: Automobiles: manufacturers my earn credits against Corporate Average Fuel Economy standard for production of alternative fuel vehicle, provided fuel sales indicate that such vehicles utilize alternative fuels.

Section 7: Enforcement: $1 per gallon penalty for non-compliance.

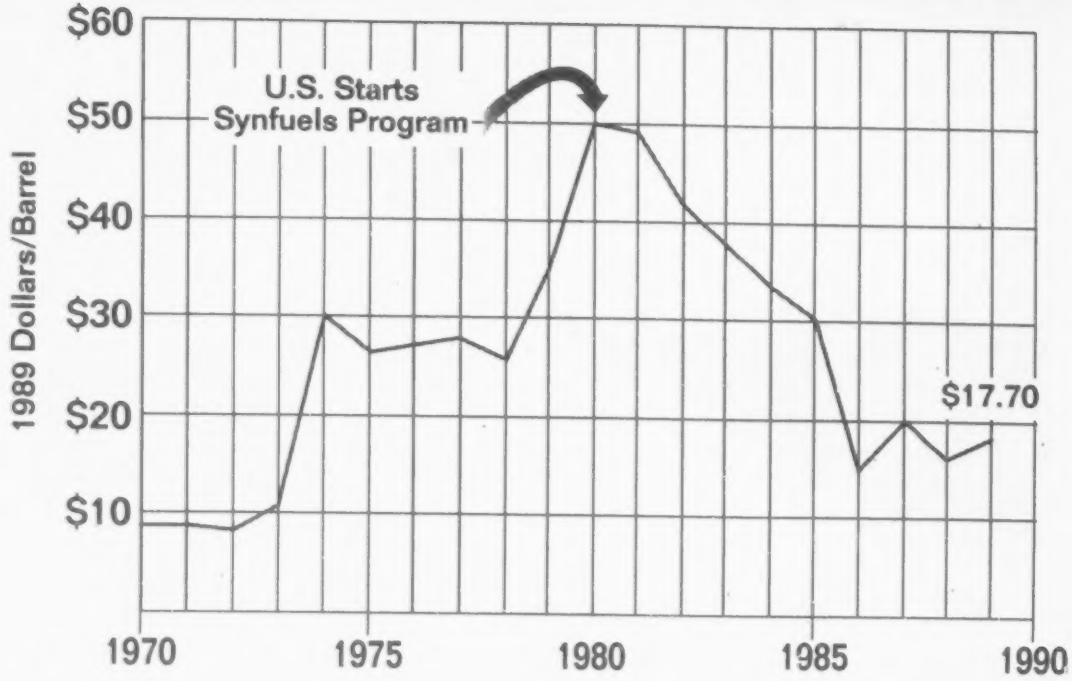
Section 8: Authorizes $10 million annually to administer program.

Section 9: Program to be coordinated with Clean Air Act.

Section 10: Regulations: Secretary may require retailers to make available sales of alternative fuels.

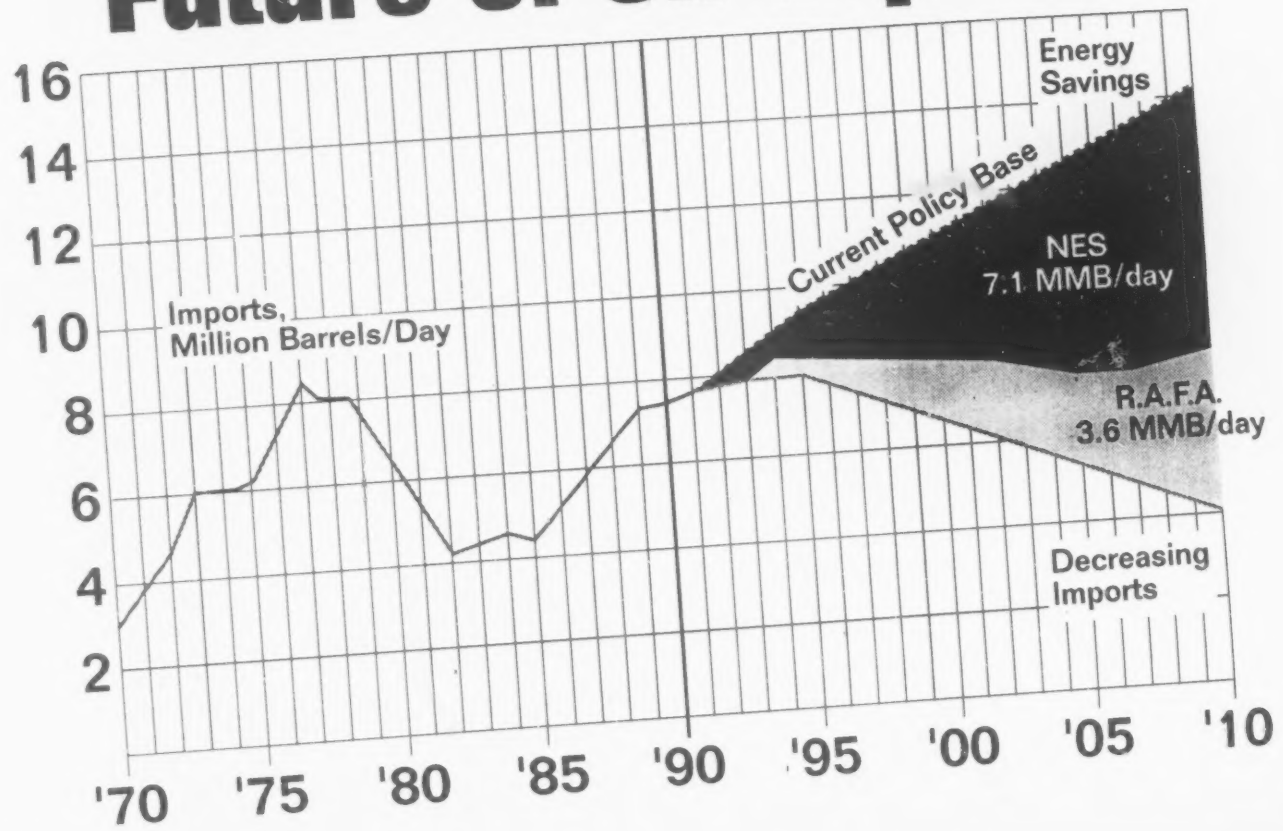
Cosponsores as of March 19: Senators Domenici, Wirth, Burdick, Burns Daschle, Craig, Conrad, Shelby, Seymour and Reid.

Historical Oil Prices Rise



Source: Energy Information Administration/Annual Energy Outlook

Future of Oil Imports



Program

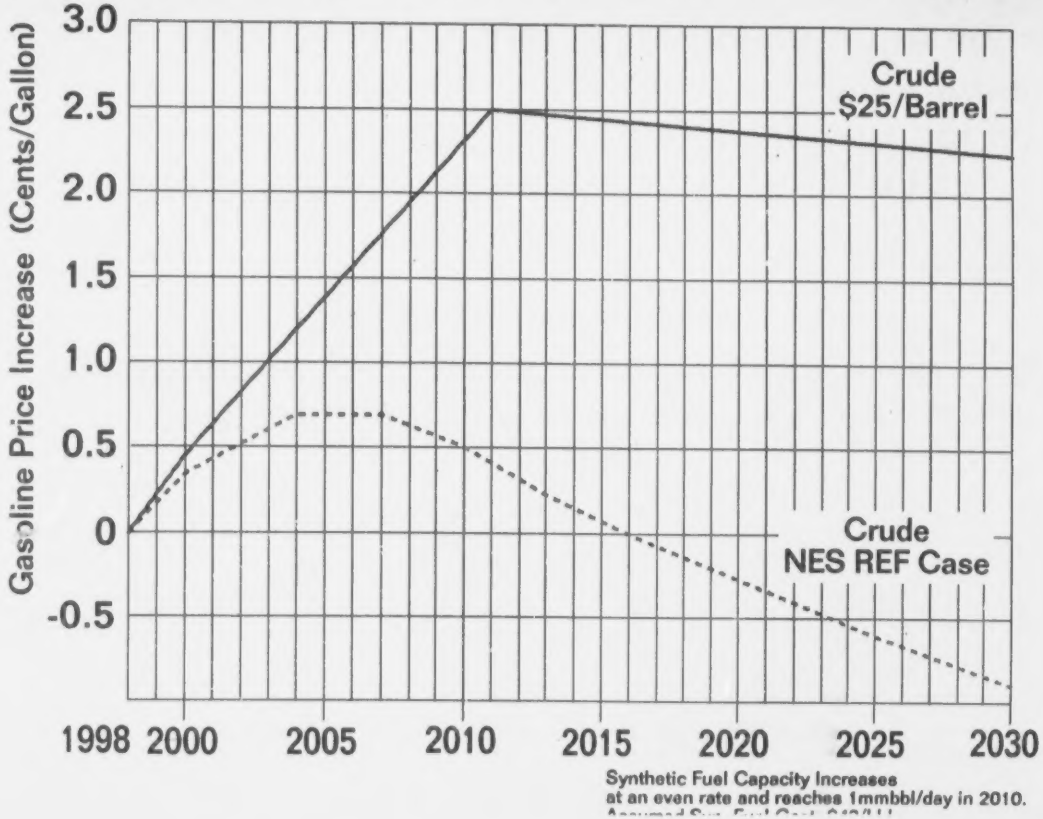
Secretary of Energy Establishes:

Targets: 10% replacement/alternatives by 1998
30% replacement/alternatives by 2010

Credit Trading: Allowed between refiners of gasoline and distributors of replacement/ alternative fuels.

Automobiles: Manufacturers may earn credits against CAFE standard for production of alternative or flexible fueled vehicles provided fuel sales indicate the actual use of alternative/replacement fuels.

Estimated Consumer Costs



Synthetic Fuel Capacity Increases
at an even rate and reaches 1mmbbl/day in 2010.

What are Replacement and Alternative Fuels?

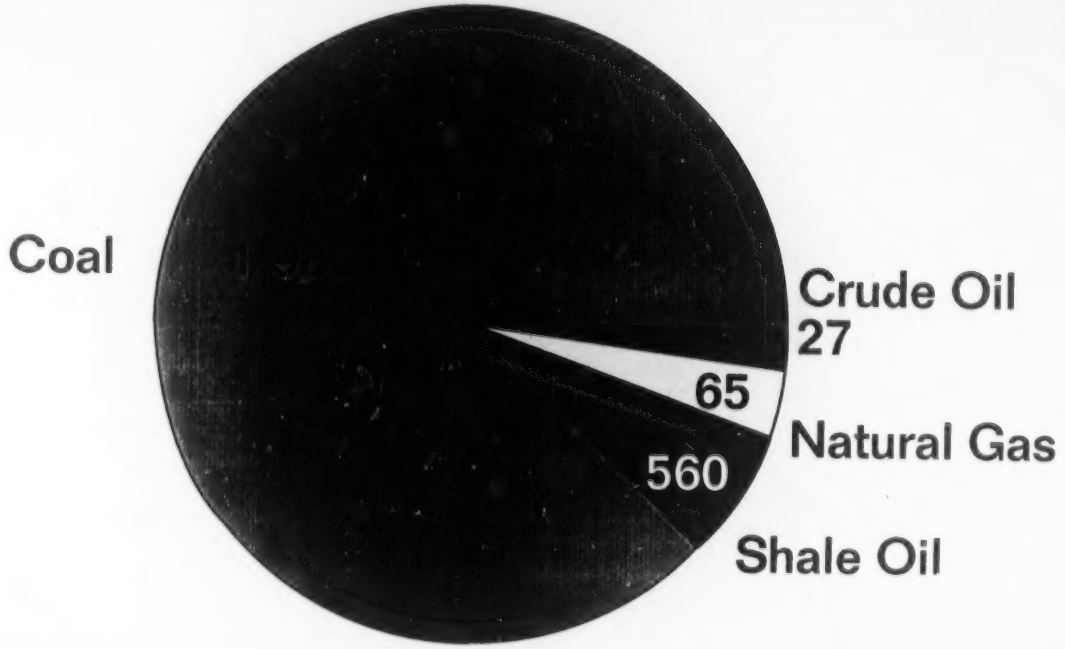
Replacement Fuels: Fuels capable of being mixed with gasoline such as alcohol. Gasohol already accounts for 8% of U.S. gasoline sales. Replacement fuels are needed to protect consumers from costly replacement of existing gasoline cars.

Alternative Fuels: Fuels not designed to be mixed with gasoline including natural gas, propane, hydrogen, electricity, and "neat" alcohol. We must ensure a market to beat the "chicken or the egg" problem of which comes first: alternative fuels or vehicles which run on alternative fuels?

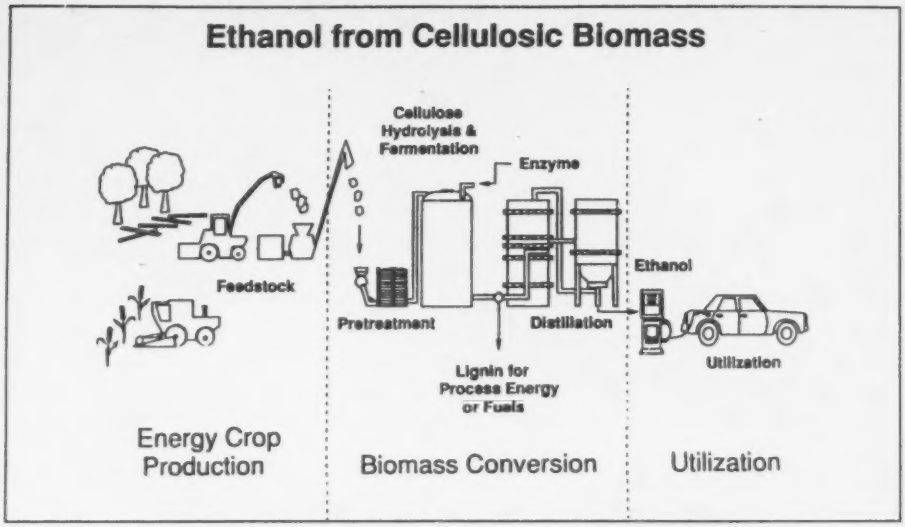
Chart Senate Republican Conference

We Can Be Energy Independent
U.S. Fossil Energy Proved Reserves

(in billions of barrels of oil equivalent)



We Can Be Energy Independent



How Much Can the U.S. Produce Economically?

Production Levels

Year	Biomass (Million Dry Tons/Year)	Ethanol (Billion Gallons/Year)	Total Gasoline Displaced (Million Barrels/Day)	Percent of Gasoline Demand
2000	116.6	12.8	0.65	8.3%
2010	361.2	39.7	2.01	21.6%
2020	616.3	67.8	3.44	34.4%
2030	1,126.1	123.9	6.29	63.5%

By 2030 we can supply at least 63.5% of our gasoline needs with renewable fuels.

The CHAIRMAN. Senator Jeffords I want to thank you very much. You have done some excellent work on this, and I think if the administration bill were to be enacted into law, you would have to have something like your proposal to make available the fuels.

There is, in fact, a tremendous chicken-and-egg problem here. I wonder—and we will get into this with other witnesses later—whether the approach is to just go in and mandate it across the market, or whether to have a more limited approach to bring along the industry to let the market test itself as with, for example, Government fleets, before you get in with a broad mandate to have every taxi driver in the country run on some alternate fuels. I think some of them would fail to see the humor in this whole thing.

But clearly, when we get ready to go in your—I mean, in the direction of a broad-based market penetration, I think we are going to have to have something like you propose.

It worries me that we would require them to come up with a certain percentage, and I do not know how the Secretary would adjust that.

I mean, what does he do when the rule now says 10 percent, and he has got all this compressed natural gas out there—you know, compressed in containers—and he runs out of containers and the Secretary says well, I have got a new rulemaking we are ready to put in and it is going to run in the Federal Register next month, and we think this rule will be final by next December?

His gas keeps piling up. I wonder whether it could be adjusted quickly enough. I guess they would have the rules that would be able to adjust quickly. I guess that would be part of the rulemaking.

Senator JEFFORDS. I would expect so, and I would hope that those kinds of questions can be answered by the Department of Energy or EPA, how they would handle these matters. But I think the concept that we have has incredible flexibility to adapt to these kinds of situations.

The CHAIRMAN. Senator Jeffords, I am just advised that we have a roll call vote. Why do I not go and vote while Senator Wallop asks you some questions? If you can both finish by the time to vote, fine. Otherwise, I will let you all decide whether to come back.

Senator JEFFORDS. Sure.

The CHAIRMAN. Thank you very much for excellent testimony.

Senator JEFFORDS. You are welcome.

Senator WALLOP. I will not be long, but I confess to a skepticism about these types of mandated intrusions into the marketplace.

It is clear to me now that the enormous subsidy, really, for ethanol, has done very little for the national energy circumstance but has done quite a lot to slow down the penetration of, perhaps, CNG, into the marketplace. Every time we force an intrusion in here you literally distort things to the point where economics are no longer the element, but either Government subsidies or penalties become the element.

It has hurt natural gas, what we have done with ethanol, and I do not really see that we would be able to supply the country's needs without creating a new dependency on an imported fuel that has environmental problems anyway.

Senator JEFFORDS. Well, first of all, the only intrusion that we have on a market is to say that oil will do its thing on the outside and we will do our thing on the alternative and replacement fuel side. We stay away from trying to solve the market problems, other than to say it is open for bids.

Now, there are existing subsidies like you refer to in ethanol. We do not fiddle with them, but our plan would operate without them. It would shift what the winning combinations might be, because of the high subsidies we have, but we can operate with that.

You can cap the subsidies at the present levels and then let the market solve—because we have already got about 700,000 barrels a year, or a day, I guess, rather, in some of these things now. So we would leave that alone at present and say, cap it, and then see what the market will supply. But leave the market open.

I agree with you. I do not want to have any market intrusion here. I want the market to solve these problems subject to environmental concerns.

Senator WALLOP. Well, does not $1 a gallon penalty for noncompliance sound like an intrusion to you?

Senator JEFFORDS. Well, it is if you have someone——

Senator WALLOP. I would feel pretty intruded upon if somebody——

Senator JEFFORDS. Well, the question is, do you want to get the independence or do you not? If you do not, I do not care whether it is 50 cents or 20 cents——

Senator WALLOP. Let me suggest that neither Senator Johnston or I, nor Secretary Watkins, nor any of the people I know of, are talking about energy independence any longer. I do not think that is a goal that is realistic in this world.

Senator JEFFORDS. Okay. Well, I just disagree with you on that, and we have the resources either in fossil fuels or in biomass to be energy independent on motor fuels in particular, and DOE has demonstrated that.

They can show with their ethanol processes that they have now—assuming commercialization, because you are breaking through the tremendous barrier—you can convert cellulose into ethanol under the process they have developed, and that means you can have almost a zero cost base if you use waste paper and things like that, or sawdust or wood chips, and we have the biomass capacity to replace all of our needs in that area with existing farmlands, without getting into competition with food. This is according to the DOE.

So to me, that may be the winner in the long run, especially if it gets you out of all the global warming problems and all of those things, because it is a neutral system with CO_2.

Senator WALLOP. Ethanol is not without its environmental problems, and I think it is a mistake to suggest it is.

I think we better recess the committee; there are five bells on now.

Senator JEFFORDS. Okay, sure.

Senator WALLOP. We will return at the call of the chairman.

[Recess.]

The CHAIRMAN. Let us resume our hearing this afternoon. We are delighted to welcome the Honorable Michael Andrews, our colleague from the House of Representatives.

Michael.

STATEMENT OF HON. MICHAEL A. ANDREWS, U.S. REPRESENTATIVE FROM TEXAS

Mr. ANDREWS. Thank you very much, Mr. Chairman. I do appreciate very much the opportunity to walk over and testify on this issue today, and I certainly want to join everyone else in the room in complimenting you on having these hearings on alternative fuels.

This is a unique issue for me, unique because I am from Texas, and unique because my committee, the Ways and Means Committee, has jurisdiction over many of these issues as well. But also it is unique because my city of Houston, which is about the third—fourth largest, is also about the second or third most polluted city in the country on any given day. At least a half of the pollution in Houston comes from automobile emissions.

Most estimates are that our city may double in the next generation. It will be a huge city, not just a fourth largest city, but a huge city, and those air quality problems will only increase, not decrease. And I think the debate that we are having in the Congress and with the participation of the White House is an important one.

Alternative fuels, I am convinced, is clearly the very best way to address the two biggest problems that we face in energy today—one, self-sufficiency, and the second, dirty air. To this end, today I am reintroducing a bill that I introduced in the last Congress, the Alternative Fuels Incentive Act of 1991.

The bill is sort of a carrot as opposed to some of the other proposals that you have heard from that are more sticks. This is a carrot. It provides tax incentives to encourage the use of clean-burning alternative fuels in all vehicles. It will provide the initial support needed I think to start a large-scale alternative fuel vehicle movement in our country.

Last year we had 74 co-sponsors. Well, that is a start. And I think the more the debate goes on and the more this is discussed, there will be more people that will look at the possibility of tax incentives to encourage conversions to alternative fuels.

What is encouraging about this kind of legislation is the diversity of the support. One of the original co-sponsors in the last Congress was Tom Downey from New York.

We do have the technology today to make alternative fuels a reality. The initial cost of converting to a system of alternative fuels and just, I guess, in the past, the natural inertia are what is holding us back.

For example, the cost of converting a vehicle to run on natural gas can be, for a bus, well over $1,000 apiece. The cost of installing a compressor station for the refueling of natural gas vehicles can run into the hundreds of thousands of dollars. These costs are significant hurdles for not just small and medium-sized corporations and small cities but large cities and large companies as well.

What I think we will see in the coming generations is very complicated infrastructure. We will see people pulling into a service station and having a choice of fuels to pick from. They may use ethanol. They may use natural gas. They may use reformulated gasoline. They may plug their car into a socket. But one thing we can be sure of that this infrastructure will be expensive. And it will be complicated.

Economic incentives I think are imperative in getting the start toward alternative fuels going, getting us off the dime.

The CHAIRMAN. Congressman Andrews, let my interrupt you at that point. I read your full statement, and I must say it is—your piece of legislation seems to make a lot of sense to me, and particularly your last statement to the effect that this is going to be a very expensive endeavor. I mean, let us not kid ourselves. It will be very expensive. And I think that a Government that is too chicken to put a tax on gasoline or whatever, which most people say is good policy, which I hasten to say I am against, because I have got my finger out there on the pulse of the American public which does not want to pay that tax, so therefore, I do not want them to pay it. But if we are too chicken to put the tax on, I mean it seems to me not the right thing to put all the expense on these fleet people out there. So we need some way to have an incentive to get people to do it.

Now, you point out in your statement that your proposal would cost only $20 million over 5 years. Now, is that a misprint? Is that $20 billion?

Mr. ANDREWS. It is not a misprint. It is not a misprint. It is a start. I do not think everybody is going to use this incentive. It is a 20 percent credit, primarily for fleet companies.

In cities like Houston though, and New Orleans, most major companies have gone to fleet vehicle uses. If we can just get fleet companies to make this conversion, it can have a significant impact. I do not envision every car in the country will take advantage of this credit initially, and certainly not in the first 5 years. What I do think is many major corporations will use this credit. I think several cities will take advantage of this kind of credit approach. And I think we can make a difference. But the cost estimated by the joint committee on taxes is only $20 million for 5 years.

The CHAIRMAN. Well, it is very modest over 5 years, because the real penetration does not take place in the first 5 years.

Mr. ANDREWS. That is correct.

The CHAIRMAN. Down the road it will cost——

Mr. ANDREWS. It will cost more down the road.

The CHAIRMAN. I mean what kind of cost are we talking about?

Mr. ANDREWS. Well, we do not know that. We do not know that.

The CHAIRMAN. I mean if it is successful, we are talking billions, are we not?

Mr. ANDREWS. We are talking—it is an expensive proposition. But what we are convinced of is that it is much more expensive to ask that company to convert his bus fleet or ask a school system to convert their bus fleet to alternative without some kind of tax incentive to get them over that hump.

The CHAIRMAN. Now, you pointed out the Canadians give a grant of $500 for a conversion of vehicles to natural gas and grants of

$50,000 for fueling station construction. That is just a flat out grant.

Mr. ANDREWS. It is just a direct grant. And we can do it that way. This just seems to be a more doable than using the tax cut. In fact, they have been successful and they have made a difference. There are over 120 public refueling stations now in Canada as a result of that single provision.

The CHAIRMAN. Now, how do you get to the fueling stations in your legislation?

Mr. ANDREWS. Well, you give a similar type credit for building a refueling station, for changing a service station where it can be used as a refueling station for natural gas or ethanol. My bill does not favor any particular fuel. I do not think we can do that. In my part of the country and yours obviously natural gas will likely be the fuel of choice. But in the Midwest it might be some other fuel.

The CHAIRMAN. You would give them the same credit for ethanol?

Mr. ANDREWS. Yes.

The CHAIRMAN. I mean ethanol now they just put another tank up there, as I appreciate it, and write ethanol on it, and it is in business.

Mr. ANDREWS. Well, I have tried not to make a distinction, because quite frankly, Mr. Chairman, I did not want to favor one fuel over another. And in terms of the politics of my own committee, I think it is more important to have a broad-based approach that does not favor natural gas. It may give more of an incentive to ethanol initially.

The CHAIRMAN. But natural gas is expensive as a fueling station, and ethanol is almost zero expense I would think. I do not know that much about it.

Mr. ANDREWS. Well, it might be necessary that we examine that, but initially, Mr. Chairman, I have not tried to distinguish between fuels at all.

The CHAIRMAN. Well, Mr. Andrews, I appreciate your testimony very much. I think we are going to have to go to some incentive. I mean, if we are really serious about alternate fuels, we cannot expect the users, the fleet owners out there, to bear 100 percent of the cost, it seems to me. It is going to take a simultaneous effort both in the Jeffords' direction and in your direction and in the administration's direction in order to get real penetration here.

Another question is whether the role of the States—it seems to me that Texas is probably the leader in alternative fuels. You point out what Houston has done. I think there are other towns in Texas that are also leaders. Texas also happens to have a lot of natural gas. I wonder how well we can provide for national policy that does not take into consideration availability and concentrations of people, et cetera?

Mr. ANDREWS. Well, I think that is one reason you have to make tax incentives, for instance, not fuel specific. And you have to recognize that there are going to be different marketplaces. One reason Tom Downey from New York is for this proposal is that there is natural gas in New York State, and in West Virginia. There are lots of fuel sources out there that we have not tapped yet. These kind of incentives I think might generate more enthusi-

asm for trying to produce natural gas in the country, not just in Texas.

The CHAIRMAN. Well, thank you very much, Mr. Andrews. We appreciate your testimony. You have been most helpful to the committee.

Mr. ANDREWS. Thank you, Mr. Chairman.

[The prepared statement of Mr. Andrews follows:]

PREPARED STATEMENT OF HON. MICHAEL A. ANDREWS, U.S. REPRESENTATIVE FROM TEXAS

Thank you, Mr. Chairman, for the opportunity to testify before the Committee this afternoon. For many years I have been an advocate for increased use of alternative fuels in this country. Anyone who has seen the brown haze that often hangs over my home of Houston will know why. I am particularly encouraged that your committee is taking time to address this crucial issue today. It is time the federal government acknowledge the value of alternative fuels and encourage their use.

Mr. Chairman, alternative fuels are clearly the best way to address two of the greatest problems we face today—energy self-sufficiency and dirty air. To this end, I am introducing today the Alternative Fuels Incentive Act of 1991. This bill will provide tax incentives to encourage the use of clean burning alternative fuels in vehicles. It will provide the initial support needed to start a large scale alternative vehicle fuel movement in the United States. Last year, I was glad to be joined by 74 of my colleagues among whom were members of both parties from many different regions of the country.

We have the technology to make alternative fuels a reality today. Only the initial cost of converting to a system of alternative fuels and natural inertia is holding us back. For example, the cost of converting a vehicle to run on natural gas can be over $1,000. The cost of installing a compressor station for the refueling of natural gas vehicles can run into the hundreds of thousands of dollars. These costs are significant hurdles to the development of an alternative fuels system.

Economic incentives are imperative in getting a widespread alternative fuels program off the ground. The bill I have introduced provides that needed push in the transportation sector. It is a necessary compliment to the initiatives you have proposed in Title 11 of your bill and the fleet conversion requirements suggested by the President.

Specifically, the Alternative Fuels Incentive Act of 1991 will provide:

A 20 percent tax credit for equipment to convert a vehicle to run on a clean burning fuel.

A 20 percent credit for refueling station equipment including tanks for liquid fuels and compressor stations for natural gas.

A 20 percent credit for the fuel system of a new vehicle produced to run only on a clean burning fuel.

Allows state and local agencies to take advantage of the credit.

It should be noted that the Joint Committee on Taxation estimates that my bill would cost only $20 million over 5 years. I believe it is a highly cost-effective way to stimulate the development of an alternative fuel vehicle market in the U.S.

The initial effect of this legislation will be to encourage private and public fleet owners to convert their vehicles to run on clean-burning fuels. This is a key area. Houston, for example, has the largest private fleet commuter system in the country. Our mass transit problem has been much improved as a result. Converting much of this existing fleet would create a market in itself for alternative fuel vehicles.

My bill would also encourage the development of a badly needed alternative fuels infrastructure in this country. The effectiveness of such incentives can be clearly seen in Canada where they have been the key to getting a widespread program off the ground. Using grants of $500 for conversion of vehicles to natural gas use and grants of $50,000 for refueling station construction, the Canadian government has prompted the rapid growth of a natural gas vehicle program. In fact, over 120 public refueling stations are currently in operation there.

Mr. Chairman, there are enormous benefits inherent in conversion to alternative fuels. Several of my distinguished Senate colleagues including Senator Rockefeller, Senator Breaux and Senator Wirth are considering this and similar proposals. As Congress works in the coming months to develop a comprehensive energy program, I hope my colleagues will join me in making a serious commitment to the use of alternative fuels.

Senator BINGAMAN. Mr. Chairman, could I just ask Congressman——

The CHAIRMAN. Oh, excuse me. I did not see you there, Jeff.

Senator BINGAMAN. Could I ask Congressman Andrews one question?

The CHAIRMAN. Of course.

Senator BINGAMAN. I just am impressed with the proposal you have got. You say here on the—or at least someone does—on this description of the bill that I have seen. It says that it allows State and local agencies to take advantage of the credit. How does that work?

Mr. ANDREWS. With a direct subsidy.

Senator BINGAMAN. I see.

Mr. ANDREWS. We will give a local municipality a direct equivalent subsidy if they convert their fleet.

Senator BINGAMAN. Oh, I see.

Mr. ANDREWS. And that could be expensive. We do not think expensive in the near term—in the short term, the first 5 years. It could be expensive down the road and it would be something that we would probably have to go back and readdress.

Senator BINGAMAN. And do you have anything in here to mandate the Federal Government to convert its own fleets to use of alternative fuels?

Mr. ANDREWS. There is nothing in my legislation that mandates anything. I think one reason, one approach we wanted to take in this bill is a pure incentive bill to encourage private fleet companies, local municipalities to exercise conversion and not make any mandates to State or local governments.

The CHAIRMAN. Well, I am thinking though if I were a State Governor or a mayor or something, my first question I guess would be, do you folks think this is important? Why is not the Federal Government doing it? And that is one of the concerns I have had with the administration's national strategic energy strategy. I am not aware that there is anything in there saying the Federal Government is going to get busy and do this, too. It seems that that would be a natural first step.

Mr. ANDREWS. It is a very good point. Thank you very much.

Senator BINGAMAN. Thank you.

The CHAIRMAN. Thank you. Next, we are happy to welcome back to the committee Linda Stuntz, Deputy Under Secretary.

STATEMENT OF LINDA G. STUNTZ, DEPUTY UNDER SECRETARY, OFFICE OF POLICY, PLANNING AND ANALYSIS, DEPARTMENT OF ENERGY

Ms. STUNTZ. Thank you very much, Mr. Chairman, and Senator. I appreciate the opportunity to appear before the committee today to discuss the administration's alternative fuel fleet proposal contained in the National Energy Strategy Act (NES).

I think this committee is well aware by now the NES has several elements that will address our use of oil in the transportation sector, particularly insofar as transportation fuels are concerned. It would remove the CAFE cap for dual fuel or flexible fuel vehicles. It would accelerate the purchase of alternative fuel vehicles for the

Federal fleet. We do not exempt the Federal fleet from our general fleet requirements, and in fact, we expect that the Federal fleet would lead the general fleet requirements based on efforts under way between the GSA and us.

Third, in the National Energy Strategy Act, we would establish an alternative fuel fleet program, which is the direct subject of today's hearing. And we are working to develop advanced transportation fuels and technology alternatives so that this could be done in a cost effective way.

Now, I know you have a full panel, so I will try to be very brief, and I know you also have a lot of questions which I will try to answer.

But I think it is very important for the committee to understand that we are operating in a context of landmark legislation passed last year, the Clean Air Act Amendments of 1990, which fundamentally affects and interacts with our fleet program. I mean I agree and share Senator Wallop's, and the Chairman's, concerns about mandates.

But I think it is very important for people to understand that what was done last year, and which I think is only beginning to be appreciated as the Environmental Protection Agency implements that Act, does already fundamentally change the way we use fuels in the transportation sector. It contains a lot of mandates which are going to be used in certain ways, depending upon which direction the industry takes to meet those requirements.

We expect that the provisions affecting gasoline composition—gasoline composition in the Clean Air Act—will reduce U.S. oil consumption by about 600,000 barrels a day by 2010. Those are primarily oxygenates in both the oxygenated fuels program and the reformulated gasoline program.

We also expect another 100,000 barrels per day savings due to the use of alternative fuels in the California pilot program, the Clean Fuel Vehicle Program. Although these vehicles will not necessarily be required to use alternative fuels, we expect, given California's leadership in this area that they will.

Now, while the Clean Air Act, Clean Fuel Fleet Program also has the potential to displace 100,000 barrels per day of oil, we do not anticipate, based on the final configuration of that program that it will necessarily result in the wide-spread use of alternative fuels in fleets, because the environmental performance standards established by that legislation could be met by vehicles operating on gasoline or on diesel fuel. Therefore, in the administration's judgment the Clean Air Act fell short of what we believe is necessary and appropriate to expand the use of alternative fuels and technology at this time.

The National Energy Strategy therefore would augment the Clean Air Act by proposing three things. Number one, that fleets in all urban areas—over 250,000 population—be required to purchase alternative fuel vehicles. Number two, that the time table for use of alternative fuel fleet vehicles be accelerated, and number three, that alternative-fuel-capable vehicles actually be used in fleets including those covered by the Clean Air Act requirements.

Now, let me again just try and talk briefly to the relationship between the Clean Air Act program and the fleet program. How do they differ and how are they the same?

The NES fleet program excludes gasoline and diesel fuel from the list of clean fuels that could be used to satisfy the vehicle purchase requirements of the program. The NES program begins earlier, 1995 instead of 1998. It is established—and this is an important point—the NES program is established at the Federal level to only affect the purchase of alternative fuel vehicles by certain fleets, while the Clean Air Act program is established by States. And in the State Implementation Plans that are done to implement the Clean Air Act, the States, if alternative vehicles are chosen, will have to require the availability fuels as a consideration of SIP approval.

If, for example, a municipality or a State chooses to meet Clean Air Act obligations by turning the alternative fuel vehicles, the State will—the Clean Air Act gave the State the authority to do this as a condition of SIP approval—mandate that the alternative fuels be made available.

Second, the NES program does not establish any independent environmental requirements, but relies on the environmental requirements set forth in the Clean Air Act amendments. It does not move up the time table for developing vehicles that can be certified to meet low emissions standards.

As I indicated, the NES program applies to all U.S. urban areas with 250,000 or more population, while the Clean Air Act program only applies to about 21 cities. The NES program also includes certain additional types of heavy trucks not included in the Clean Air Act program. They do have, however—the NES and the Clean Air Act amendments—at least five similarities that I think are important.

One, they both identify the same list of alternative fuels that could be used to satisfy the program except for reformulated gasoline and diesel fuel, as I mentioned earlier. Second, they both provide credits and trading to make compliance more flexible and less costly. Third, they both provide opportunities to delay the program if the vehicles are not in fact available. Fourth, the NES program is designed to be compatible with any of the fleet requirements that may be developed by the States for their SIP's.

And let me add a fifth comparable point. Both focus on fleets that are centrally fueled or capable of being centrally fueled. We do not, for example, in our assumptions, as to the oil actually displaced by this program, assume 100 percent of all covered fleets would be using alternative fleet vehicles. We expect about 50 percent of the fleets will in fact be included in the program.

Let me turn now to the question of supplies of alternative fuels and alternative fuel vehicles. We estimate the NES alternative fleet program would result in about 3 million vehicles operating by 2000, and 5.4 million operating by 2010. We believe the motor vehicle industry is well able to produce these vehicles, beginning with their gradual introduction even before 1995.

Just next Monday, for example, Pearce Transit in Tacoma, Washington will be dedicating 19 new CNG buses, the first of a total 50 that will be serving Pearce County, which is Tacoma, by

late 1992. I think you have already heard of it and are aware of State initiatives in this area. The important thing is that this transition has begun. It is not as if we do not have these technologies and they are not available.

We expect that several alternative fuels could each achieve the potential 350,000 barrels per day oil displacement in 2010 which we estimate for this fleet program including CNG, liquefied petroleum gas, alcohols and electricity. Since in fact it will be a combination of these fuels that would be used in the fleets, we do not believe fuels supplies in this magnitude would be a problem.

We are also confident that fuel distributors and natural gas distribution companies will make every effort to provide public refueling stations in convenient locations for these fleets. It is in their interest to do this, because it is a new potential market.

In addition, we will work with the U.S. Alternative Fuels Council to help ensure the cooperative implementation of this program by automobile producers, engine manufacturers, petroleum distribution companies, alcohol producers, propane producers and distributors, and natural gas and electric utilities.

Let me mention briefly how the Clean Air Act, the NES Fleet Program, and the NES incentive to produce fuel-flexible vehicles by lifting the alternative motor fuels cap on CAFE credits work together to provide a coherent and effective program. We think that perhaps the most important aspect of the NES Fleet Program is that it would stimulate the development of alternative fuel vehicles that could be used in the general vehicle fleet.

One of the reasons we chose to not require dedicated vehicles but also allow fuel-flexible vehicles is in fact these vehicles are usually resold into the general vehicle population. They are not maintained in fleets for a very long time. We do not want to impair that resale value. We wanted to make those vehicles available to the general population so they could become familiar with them as well.

[The prepared statement of Ms. Stuntz follows:]

PREPARED STATEMENT OF LINDA G. STUNTZ, DEPUTY UNDER SECRETARY, POLICY, PLANNING AND ANALYSIS, DEPARTMENT OF ENERGY

I appreciate the opportunity to appear before the Committee on Energy and Natural Resources today to discuss the Administration's alternative fuel fleet proposal contained in the National Energy Strategy Act (Title VII of S. 570) and respond to the Committee's questions concerning the relationship between this proposal and fleet requirements in the Clean Air Act Amendments of 1990 (CAAA). I will also discuss our views on whether sufficient alternative fuel vehicles and alternative fuel supplies would be available for this proposed program.

As the Secretary has discussed previously with this Committee, the National Energy Strategy (NES) would rely on several measures to reduce the transportation sector's near total reliance on oil. The proposed NES alternative fuel fleet program is a major element of this broader program.

NATIONAL ENERGY STRATEGY

The NES would reduce the amount of energy we use to move people and goods by improving the efficiency of all the vehicles on the road, and by increasing the overall efficiency of the transportation system itself. Through expanded use of alternative fuels and technologies, the NES would increase conservation, expand consumer fuel choices and erode oil's dominant role in the transportation sector.

Before going into detail, let me make an initial observation about the need to be analytically rigorous in evaluating conservation alternatives. Just as emission con-

trol approaches should be compared on the basis of relative cost per ton of pollutant removed, so conservation priorities ought to be analyzed on the basis of relative cost per barrel saved. Viewed in this light, we believe the savings that I shall describe in more detail in a moment are well worth the minimal cost per barrel of oil conserved, which we estimate at about $10 a barrel.

While the NES has been criticized for being too free market-oriented, we believe this flexibility is a decided plus. For example, just two days ago, GM announced its recommendations to all its customers to use reformulated gasoline in all present and future cars, beginning as soon as possible—that is, before the Clean Air Act due date of 1995. GM noted that it had "reformulated" its cars over the years with catalytic converters, fuel injection, electronic monitoring, etc. It is time now that we look to reformulations on the fuel side of the equation as well, for both emission reductions and conservation in order to take advantage of the lowest cost improvements available.

Specifically, the NES will:

Expand Efforts to Develop Advanced Propulsion Technologies
Accelerate Scrappage of Older Cars
Evaluate Corporate Average Fuel Economy (CAFE) Program
Improve Consumer Information on Fuel Economy and System Efficiency
Promote Mass Transit and Ride Sharing
Diversify Transportation Fuels by:
Removing the CAFE Cap for Dual Fuel or Flexible Fuel Vehicles
Accelerating the Purchase of Alternative Fuel Vehicles for the Federal Fleet
Establishing an Alternative Fuel Fleet Program; and
Developing Advanced Transportation Fuels from Biomass

The NES measures represent an integrated approach to reducing oil consumption in the transportation sector. We expect that NES will reduce projected oil consumption by 3.4 million barrels per day in the year 2010 primarily due to the expanded use of alternative fuels.

ENERGY IMPACTS OF THE CLEAN AIR ACT AMENDMENTS OF 1990

There is a very specific and synergistic relationship between the NES and the CAAA. The CAAA took very important steps towards the use of cleaner burning fuels that, in addition to reducing emissions, reduce our dependence on oil. The CAAA included requirements to reformulate and oxygenate gasoline, and set up pilot and fleet programs to introduce the use of clean fueled vehicles. More specifically, the CAAA requires that:

(1) Beginning in 1992, oxygenated gasoline will be required in CO nonattainment areas (high CO seasons); and beginning in 1995, reformulated gasoline will be required in the nine worst ozone nonattainment areas. This reformulated gasoline must contain a minimum level of oxygenate year round. In addition, States, with other ozone non-attainment areas, can opt-in to the reformulated gasoline program, thus expanding its maximum potential coverage to about 100 urban areas.

(2) A pilot program will be established in California that would result in the production and sale of 150,000 clean fuel vehicles by 1996 and 300,000 clean fuel vehicles per year by 1999.

(3) In 1998, certain fleet operators will be required to purchase clean fueled vehicles. By 2000, at least 70% of the purchases by these fleet operators must be clean fuel vehicles. (This program will be discussed in more detail below.)

As a result of the CAAA, we expect that, by the year 2000, virtually all of the gasoline sold in the U.S. will be reformulated. The resulting use of non-petroleum based oxygenates in reformulated gasoline could reduce projected U.S. oil use by about 600 thousand barrels per day by 2010. Assuming alternative fueled vehicles are used to satisfy the requirements of the California Pilot program, another 100 thousand barrels per day of oil could be displaced by 2010. The clean fueled fleet vehicle program also has the potential to displace over 100 thousand barrels per day of oil if alternative fueled vehicles are actually used in this program. However, alternative fueled vehicles need not be used for either the California Pilot program or the Clean Fuel Fleet program if the emission requirements set for these vehicles can be met with vehicles operating on reformulated gasoline or diesel fuel.

In the process of developing the NES, the Department determined that, due to ongoing initiatives by the State of California, the California Pilot program would most likely be met by the use of alternative fueled vehicles. However, we believe that the Clean Fueled Fleet program, which will apply in approximately 21 urban

areas, would be predominately met by the use of vehicles operating on reformulated gasoline and diesel fuel.

This assessment led us to conclude that the final CAAA fell short of what the Administration believes is necessary and appropriate to expand the use of alternative fuels and technology. The NES, therefore, would augment the CAAA by proposing that: (1) fleets in all urban areas be required to purchase alternative fuel vehicles; (2) the timetable for the use of alternative fueled fleet vehicles be accelerated; and (3) alternative fuel-capable vehicles actually be used in fleets, including those covered by CAAA requirements. Under the NES proposals, reformulated gasoline or diesel fuel, and additional emission control technology, could be used to meet the CAAA clean fuel fleet requirements only if the vehicles that can meet these requirements on conventional fuels are dual-fueled or flex-fueled vehicles that are also capable of meeting them on alternative fuels.

This proposal builds on alternative fuel fleet programs under way in Texas and elsewhere. We estimate that these NES fleet requirements would displace an additional 350 thousand barrels per day of oil in the year 2010. More importantly, this program would stimulate the development of alternative fuel vehicles that could be used in the general vehicle fleet, while encouraging the establishment of a fuel distribution infrastructure that will make alternative fuels available to the general public.

NES ALTERNATIVE FUEL FLEET REQUIREMENTS

The NES alternative fuel fleet program applies to persons who own, operate, lease, or otherwise control a fleet of at least 10 vehicles in urban areas that have a population of at least 250,000 people and are classified as a serious, severe, or extreme ozone nonattainment area. The NES alternative fuel program also would apply to persons who own, operate, lease, or otherwise control a fleet of at least 20 vehicles in other urban areas of at least 250,000 population. The vehicles covered by the NES provisions include cars, trucks, and buses. Excepted vehicles include intercity passenger buses and multi-unit trucks over 26,000 pounds gross vehicle weight. In addition, rental vehicles, emergency and law enforcement vehicles, and certain other classes of vehicles are exempted.

The acquisition schedule for all covered vehicles, except for urban buses, is:

1995, 10% of new vehicle purchases,
1996, 15% of new vehicle purchases,
1997, 25% of new vehicle purchases,
1998, 50% of new vehicle purchases,
1999, 75% of new vehicle purchases,
2000 and after, 90% of new vehicle purchases.

For urban buses, the acquisition schedule is:

2000, 50% of new vehicle purchases,
2001, 75% of new vehicle purchases,
2002, 80% of new vehicle purchases,
2003 and after, 90% of new vehicle purchases.

An alternative fueled vehicle is defined as one that operates on methanol, ethanol, or other alcohol mixtures containing 85% or more by volume of methanol, ethanol, or other alcohol with gasoline, or vehicles that operate on natural gas, liquid petroleum gas, hydrogen, or electricity. These vehicles can be dedicated alternative fuel vehicles or vehicles that are capable of operating on either alternative fuels or conventional fuels.

The Secretary of Energy would, under this proposal, be able to waive these requirements if alternative fuel vehicles were not available for purchase. Credits and trading are provided in order to provide compliance flexibility and reduce costs, especially in the earlier years of the program. For example, a fleet operator or other vehicle owner who exceeded the minimum requirements for alternative fuel vehicle purchases could obtain credit to apply against future year obligations or could trade this credit to an operator who did not meet the minimum level of purchases required.

COMPARISON OF NES ALTERNATIVE FUEL PROPOSAL AND CLEAN AIR ACT REQUIREMENTS

The CAAA clean fuel fleet requirement applies to urban areas that have a population of at least 250,000 and are classified as a serious, severe, or extreme ozone nonattainment area (about 21 urban areas meet this definition). This program, as does the NES proposal, includes fleets of 10 or more vehicles, but begins in 1998 instead of 1995. In 1998, 30% of new vehicle purchases would be required to meet clean fuel standards, and, by 2000, this would be increased to 70% of new vehicle

purchases. The clean fuel standards are 0.075 grams per mile (GPM) non-methane hydrocarbon, 3.4 GPM CO and 0.2 GPM $NO5_x$. The program may be delayed until 2001 if vehicles meeting these requirements are not being produced for sale in California in 1998.

The States must revise their State Implementation Plans (SIPs) to implement this program in the required urban areas. The covered fleet operators are owners or operators of centrally fueled fleets or fleets capable of being centrally fueled. The States must consult with fleet operators, vehicle manufacturers, fuel producers and distributors, and other interested parties before issuing a revision to their SIP. States must consider factors such as operational range, specialty uses, vehicle and fuel availability, cost, safety, and the resale value of vehicles. The revised SIP shall provide that the choice of clean fuel vehicles and fuels shall be made by the covered fleet operators, and that fuel providers be required to make the chosen clean fuels available to the covered operators.

The NES fleet requirements are designed so they will be compatible with the SIPs developed by the States to implement this CAAA requirement. For example, we are not proposing to push forward the low emission vehicle (LEV) requirements earlier than 1998. At least initially, the alternative fueled vehicles would only have to be certified to standards required of conventional vehicles. However, because many of the alternative fueled vehicles sold before 1998 would emit lower non-methane hydrocarbon emissions than conventional vehicles, the environmental benefits of these alternative fueled vehicles would begin in 1995. In 1998 and thereafter, the new LEV requirements would ensure significant emission reductions.

The NES fleet proposal covers more vehicles, both in geographical distribution and in vehicle types, than are included in the CAAA clean fuel fleet requirements. The NES proposal would apply in urban areas with about two-thirds of the Nation's population, while the 21 urban areas covered by the CAAA clean fuel fleet programs account for about one-third. The NES proposal includes single unit trucks over 26,000 lbs. gross vehicle weight (e.g., trash compactors), while the CAAA requirements include only trucks up to 26,000 lbs. gross vehicle weight. Consequently, we expect that substantially more total vehicles will be involved in the NES program than the CAAA program. However, all of the CAAA clean fuel fleet vehicles would be covered by the NES requirements. The NES definition of an "alternative fuel" is identical to the CAAA definition of a "clean alternative fuel" except that "reformulated gasoline" and "diesel" are eliminated.

All of the fleet operators that would be covered by both the NES and CAAA requirements would have to purchase alternative fueled vehicles that meet the LEV standards contained in the CAAA. The additional requirements applied to fleet operators in a State's SIP should not be inconsistent with the NES requirements since the NES requirements are restricted to vehicle purchase, not operating, requirements. Any SIP requirements pertaining to the fuel availability or refueling of covered clean fueled vehicles (CAAA) would apply to the alternative fueled vehicles purchased in response to the combined CAAA and NES requirements.

For example, fuel distributors would be required to provide alternative fuels to dedicated alternative fuel vehicles covered by the CAAA program. If a vehicle covered by the CAAA program were able to meet clean fuel standards on both reformulated gasoline and an alternative fuel, no additional requirements would be placed on operators beyond the SIP, and the vehicle may not be required to be refueled with the alternative fuel. However, if the purchased vehicles can only meet the LEV standards contained in the CAAA by operating on an alternative fuel (in the case of dual or flexible alternative fueled vehicles), the SIP would require that alternative fuels be made available to covered fleet operators and, would require covered operators to purchase the alternative fuel.

Fleets only purchased in response to the NES requirements would not be bound by SIPs that do not specifically apply to them. Therefore, fuel distributors would not be required to provide alternative fuels for these fleets. However, we expect that fuels would be made available and that fleet operators would use those fuels, even in dual or flexible fueled vehicles.

SUPPLIES OF ALTERNATIVE FUELS AND ALTERNATIVE FUEL VEHICLES

We estimate that the NES alternative fuel fleet program would result in about 3 million vehicles operating by 2000 and 5.4 million operating by 2010. We expect that the motor vehicle industry will be able to produce these vehicles beginning with their gradual introduction in 1995. The rapid progress that is being made on developing a wide range of alternative fuel vehicles causes us to believe that these vehicles will be made available in sufficient numbers and models to satisfy the require-

ments of the NES program. If, for unforeseen reasons, they are not made available, the Secretary of Energy would have the authority to waive compliance requirements, in part or in whole.

We estimate that the vehicles that are likely to be purchased in response to this program will displace about 350 thousand barrels per day of petroleum by 2010. We expect that several alternative fuels would be used to achieve this displacement, including, compressed natural gas, liquefied petroleum gas, ethanol, methanol, and electricity. We are confident that these fuels would be available in sufficient quantities to fuel these vehicles. In order to illustrate this, if CNG were the only fuel used to meet this requirement (a very unlikely scenario), 0.75 TCF of natural gas would be required. We estimate that the natural gas industry would be fully able to produce and distribute an additional 0.75 TCF of gas by 2010. Likewise, it would be feasible for other alternative fuels such as liquefied petroleum gas, electricity, or alcohol to each supply this entire market. Since no single fuel would be exclusively used, there is very little doubt that a combination of fuels could be supplied in sufficient volumes to meet the demand.

We are also confident that fuel distributors and natural gas distribution companies will make every effort to provide public refueling stations in convenient locations for these fleets. The cooperation of the energy industry to provide fuels for existing pilot fleets of alternative fuel vehicles is evidence of the likelihood that such public refueling outlets will be made available. We will work with the U.S. Alternative Fuels Council to help ensure the cooperative implementation of this program by automobile producers, engine manufacturers, petroleum distribution companies, alcohol producers, propane producers and distributors, and natural gas and electric utilities. We will also be, through our initiative to expand the use of alternative fueled vehicles in the Federal fleet, demonstrating these vehicles in fleet operations. Many States are also engaging in alternative fuel demonstration programs.

OTHER NES ALTERNATIVE FUEL PROGRAMS

The NES also provides important incentives for auto manufacturers by eliminating the cap on the fuel economy standards credits (CAFE credits) that can be earned by producing dual fueled or fuel-flexible vehicles.

The CAAA, the NES fleet program and the NES incentive to produce fuel flexible vehicles are synergistic measures that help each other succeed and will produce substantial oil savings. We expect that the vehicle manufacturers will respond to our incentives by gradually shifting light duty vehicle production to fuel flexible or dual-fueled vehicles. While we do not expect that the general public will immediately shift away from gasoline as its primary fuel, we estimate that, by 2010, non-fleet alternative fueled vehicles would be saving 1 million barrels per day of oil.

Taken together, the alternative fuel provisions of the CAAA and the NES are projected to displace over 2 million barrels per day of oil by 2010. We expect that in 20 years we will have effectively shifted the transportation system away from its near total dependence on petroleum, not by setting up a command and control policy that will dictate the final outcome, but by recommending a combination of measures that will allow true competition among all fuels.

The CHAIRMAN. Let me interrupt at that point. I have read your full statement, and I would like to ask some questions, particularly starting with your lifting of the cap on the CAFE. We just heard testimony this morning that to lift the cap, then all the manufacturers would go to probably an ethanol-capable vehicle, because that is the cheapest way to comply with the CAFE standards, without at the same time getting the reduction and fuel consumption. Are they wrong?

Ms. STUNTZ. That is a plausible scenario, Mr. Chairman, but I think there are others. And first of all, I believe that an ethanol-capable vehicle is also in almost all cases a methanol capable vehicle. So it is not as if we are setting up a single, favored technology. But it also depends in great part on what the natural gas industry chooses to do in terms of making and then providing incentives for local governments and for consumers and for fleet users to go to CNG.

There are efforts under way—I think collaboratively with the gas industry and the automotive industry to produce original equipment gas vehicles. That is what it is going to take, because we do not believe that it is fair or appropriate to require people to purchase and use vehicles that cannot be covered by manufacturer warranties.

That is a plausible scenario, but we do not think it is a necessary scenario. And we, in fact, expect there to be a combination of fuels and technologies that would meet our requirement.

The CHAIRMAN. Can you give me any idea of the cost of an ethanol-capable vehicle, as designed here, that is 85 percent ethanol, as opposed to a natural gas retrofit?

Ms. STUNTZ. The current estimates for alcohol fuel-flexible vehicles are $200 to $300 per car. CNG, we think is about $600 to $800 per car.

The CHAIRMAN. Well, now—and the ethanol-capable car does not have to run on ethanol. It can use gasoline, can it not?

Ms. STUNTZ. That is correct.

The CHAIRMAN. Well, would your program not just end up then with 2 million—or 3 million vehicles by the year 2000 being ethanol capable, and probably using gasoline?

Ms. STUNTZ. I think the other equation you have to consider is the cost of operation and maintenance and resale costs. In fact, compressed natural gas—and I know you have witnesses on this alternative later—but I think you are well aware, it is substantially less expensive than gasoline or than alcohol.

So, it may be that if you put the premium on the up-front costs, the manufacturers will be able to sell those alcohol vehicles. But if, in fact, their customers are saying we want vehicles that are going to cost us less to operate over the longer term, you will get other vehicles coming in, in addition, depending upon what fuel is cost effective for that use.

The CHAIRMAN. Well, it seems to me, that your program here gives an incentive to go ethanol. You lift the cap, so the automobile companies are trying desperately to comply with CAFE standards—if we enact them here. And then you give them a cost of $200 to $300, as opposed to $1,000. And your penetration begins fairly slowly—well, actually, it begins early, in one sense 1995, with 10 percent.

But these companies are probably going to have to contract long-term because, I mean, they cannot just go to the show window in 1995 and begin to purchase. They are going to have to make these orders probably years in advance. Which means they would be probably ordering their vehicles—their 10 percent vehicles—how far out in advance—2 or 3 years, at least. So they have to order now. And if they begin to order for 1995 and they are only ethanol-capable vehicles, chances are you fix ethanol as the means of compliance here, and a bill which was designed to encourage natural gas and other natural fuels, ends up picking the winner without actually using the ethanol.

What is your answer to that?

Ms. STUNTZ. Well, let me just add one other sort of complicating factor—and I do not know if this was discussed this morning—but

manufacturers of dedicated vehicles get higher valued CAFE credits than manufacturers of fuel-flexible vehicles.

And so a dedicated CNG vehicle, for example, would get much more CAFE credits for the manufacturer—and is a much more available technology than is a dedicated alcohol vehicle. So, again, I do not disagree that the scenario you outlined is a possibility, but I think there are others that are equally, and perhaps more possible, if you look at things like life-cycle costs and the way the CAFE credit program actually works between dedicated and fuel-flexible vehicles.

The CHAIRMAN. I hope I do not deeply offend too many people when I say that my enthusiasm for ethanol has been requited somewhat. See, in Louisiana, we used to have $1.60 per gallon combined State and Federal subsidy—$1.60 a gallon. In addition to that, we had subsidized grants, loan guarantees—and they still could not make it.

Not only that, but the amount of energy you use to make a gallon of ethanol is about—does it not take about as much energy input as it does energy output? I mean, if we are trying to save energy, and you cannot pipeline—I understand it breaks down over time. I mean, I am just wondering why we are rushing pell mell into—I mean, give them a little help. Give them a little help.

But have we not learned our lesson? I think you would have to have 40 percent of all the grain crops in the United States to fill the ethanol needs. I mean, you know all those figures. Now let us not go pell mell into grain.

Senator WALLOP. Well, that is only 8 percent of the need. In fact, if you reduced the whole State of Iowa and made no more corn flakes and no more corn sweeteners, and fed not another hog nor another steer, and did nothing but grow corn, you would take care of eight-tenths of 1 percent of the Nation's needs.

The CHAIRMAN. Yes, I mean I just wonder—I understand the agricultural people. And I want to support them. When it comes to putting a plant in Louisiana I am for it.

[Laughter.]

The CHAIRMAN. In fact, I have one down there that went broke. A $26 million loan guarantee at $1.60 a gallon, and they still could not make it. Now something has to be fundamentally wrong.

Now, I want to do something that—I mean, my bias is natural gas because I think we have lots of it. It is about the cleanest thing around until you get to electric cars, and then that is my next bias. If we could really mandate those, I would say let us go all electric. But I do not think—I think we need to encourage them.

But we are talking about a mandate here. And frankly—as much as I want to go with this, I mean, I really want to be bold. I do not think the administration proposal passes the straight-face test. You know? This is awfully strong. And yet when it comes to the Federal Government, oh, we are going to encourage the Federal Government. We are not going to mandate it.

It is my bias to do exactly the opposite—to mandate the Federal Government to buy alternate fuels, because you know, we can mandate GSA in their motor pools to have the fueling stations and have all the automobiles and the Post Office, et cetera, et cetera—and we can get some real significant penetration right away with

that, without being terribly unfair to the cabbies and the truckers and all of those.

I mean, I can see these interstate truckers, when you tell them they have to have alternative fuels, and there is no place to fill up along the way, except ethanol. I mean, they can put a pump of ethanol out there. But it takes a real tremendous investment to go in—in natural gas which I think we ought to go to. We talk about the chicken and the egg. But if you put an ethanol egg out there, it is going to hatch into an ethanol chicken.

[Laughter.]

The CHAIRMAN. And I am afraid that is what you are doing here.

I wish you would reply in writing, or orally right now, on the question of mandating the Federal Government to the maximum.

[The information follows:]

INCLUSION OF FEDERAL VEHICLES IN FLEET MANDATE

The NES legislative proposal excluded Federal vehicles because the Administration preferred to rely, to the extent possible, on existing authority (the Alternative Motor Fuels Act of 1988) and to act more quickly than is proposed to be required for private and other non-Federal fleets. We plan to require that the Federal fleet be rapidly shifted to alternative fuel vehicles as part of an Executive order on energy efficiency. We expect that this order will require the Federal Government to purchase the maximum number practicable of alternative fuel vehicles prior to the end of model year 1995. This pre-1995 Federal purchase program will enable Federal agencies to meet, on an accelerated schedule, the proposed requirements for non-Federal fleets, which would begin in 1995.

Ms. STUNTZ. If I could just make one point on that—the Federal Government is absolutely included in this fleet—the Federal Government is a fleet owner. We are not exempting them from being included in this NES fleet-mandate program. And, in fact, we expect to be ahead of the percentage requirements that are contained in the bill. So there is certainly no intention on our part to exempt the Federal Government.

And I guess, secondly, just a footnote—the point you made on interstate truckers is also one we absolutely agree with. And that is why, where range is very important, we did not include them in the program. Those types of trucks are not available, are not subject to the fleet mandate.

Third, I guess I just—we do not think we have laid an ethanol egg here. We can respond in writing in greater detail on why we think that is not the case. I think there will be some alcohol vehicles produced, absolutely. But you cannot produce an ethanol vehicle—as I understand the technology—that is not also capable of running on methanol.

[The information follows:]

ETHANOL AS AN ALTERNATIVE FUEL FOR FLEETS

We expect ethanol to play a role as an alternative fuel for fleets, but it is likely to be limited in the near term for several reasons:

Current ethanol production has a ready and economically attractive market as a blending agent (10% by volume) in gasoline. This market will expand with the Clean Air Act oxygenate requirements. There will be little incentive in the near term to sell ethanol as the primary component of a vehicle fuel (85% by volume).

The ability of the grain-based ethanol industry to expand capacity is limited. The GAO and USDA have both estimated that any more than a three-fold increase, about 3 billion gallons per year, would be very difficult to achieve.

Currently, grain-based ethanol costs $0.90 to $1.80 per gallon to produce, substantially higher than the wholesale cost of gasoline or the likely costs of other alternative fuels, such as CNG and LPG.

While the NES calls for a major enhancement of R&D on cellulose-based ethanol, the expected large scale introduction of cellulose-ethanol would occur more than a decade from now. Conversion of lower cost, non-food feedstocks (such as grasses, trees, grain and corn wastes, waste paper and other cellulose sources) to ethanol, if successful, could overcome the cost, feedstock availability and regionality limitations of current ethanol production.

Taken together these factors argue strongly that ethanol will be only one of many fuels used by alternative fuel fleet vehicles.

When heavy duty vehicles are concerned, CNG technology is way ahead of alcohol technology. And dedicated CNG technology is ahead of fuel flexible ethanol or alcohol technology.

So I think it is going to be a combination of those things. And it certainly is not our intention to try to pick a fuel winner at this point in time—we would oppose that, as a matter of fact.

The CHAIRMAN. Staff has just given me the definitions from your bill. Section 711, "person would be defined to include State and local governments, and exclude the United States."

Ms. STUNTZ. Well, it is not our intention——

The CHAIRMAN. "A covered person would be a person who must comply with the alternate fuel vehicle acquisition. . . ."

Ms. STUNTZ. Well, we may have a drafting error, then. But it certainly was not—it was not our policy to exclude the Federal Government, and it is not our intention that they would be excluded.

The CHAIRMAN. Could we push the Government along a little bit faster and the private sector maybe a few steps slower?

Ms. STUNTZ. I think we could, and I think we will try to do that. But the questions becomes, you know, by including the private sector in, with appropriate outs for lack of technology or cost effectiveness, you can reduce the costs of the whole program.

Because the reason it is costing the Federal Government so much right now, is that—and some of the States who are getting into this—is that we are buying in very small batches; we are buying Crown Victorias when what we really want are Escorts.

If, in fact, we could get larger batches involved, but provide the manufacturers incentive to provide the vehicles we want, the cost for everybody would come down.

The CHAIRMAN. Would the Government buy be big enough to get that response?

Ms. STUNTZ. It would begin to—particularly given what some of the States, I think, are going to be doing anyway. But we believed—and our analysis demonstrated—that by getting about the 50 percent of fleets that we cover involved, that would substantially bring down the cost to everyone, and begin to really build the market for these.

The CHAIRMAN. Senator Wallop.

Senator WALLOP. Thank you, Mr. Chairman.

I am concerned that before Federal policies expand the use of alternative fuels, that we really need to understand the consequences for fuel producers and for fuel marketers, the affected fleet operators that will be mandated to do this.

And I want to ask if you could say—or would you have to reply in writing—which alternative fuels already have a distribution system, and which alternative fuels will need one created for it?

Ms. STUNTZ. Senator, basically, there are distribution systems in place for all of these at varying levels of volumes. There are issues about pipeline ability of methanol, for example. But methanol is now being provided by truck, in the places where it is being used in California. And as the chairman pointed out, all that is necessary to refit a refueling station for methanol, is you put another tank in the ground. Natural gas, the pipelines are there.

Senator WALLOP. When I hear you say "all that is necessary"—I am thinking about me, if I own my little gas station, and you say all that is necessary is you spend another $16,000 and get an EPA permit, and get the Corps of Engineers, and make sure you do not have a wetland, and all of these other things, all that is necessary——

[Laughter.]

Senator WALLOP. And all that is necessary ends up breaking me.

Now, it seems to me that we have to pay attention to the consequences of it. It is easy for people who live inside the Beltway to mandate things within a set of parameters that are basically understandable here, but do not exist in Wyoming, for example.

What alternative fuels actually reduce energy efficiency by requiring more Btu's per mile driven?

Ms. STUNTZ. Senator, alternative fuels are less dense than gasoline, and so contain fewer Btu's per volume—whether it is gallon, or pound, or MCF. But in terms of mileage per Btu, they are not less efficient. Many are, in fact, more efficient.

Senator WALLOP. But some are less?

Ms. STUNTZ. I do not think any of them are less, in terms of miles per Btu. They are less—as I said—they are less dense than gasoline, and some have fewer Btu's per volume, so you have to fill up more. That may be what you——

Senator WALLOP. Well, there again—I am a fleet operator, and, except in a recent period with natural gas falling off from the oil standard—Btu's have a habit of costing about the same. So if it is going to require more Btu's per mile driven, then I am hurting, am I not? I mean, if I own a fleet?

Ms. STUNTZ. I do not think it will cost you—it will not take more Btu's per mile driven. It just takes more tank space to hold the same amount of Btu's. And the cost of the fuels—I mean, I agree with you that the costs of the fuels tend to reflect that. That is why natural gas on a per-volume basis is much cheaper than gasoline, because it has fewer Btu's on the same volume basis than does gasoline. It has to be cheaper in order to be competitive.

Senator WALLOP. Well, I mean you still end up having to go somewhere with that volume.

Ms. STUNTZ. That is right, and that is another reason why we thought the fleets—many of which sort of operate in urban areas, and relatively limited numbers of miles per day—are a good target for alternative fuels that do have more limited range per tank than does gasoline.

Senator WALLOP. But you do not count this as an intrusion—a Federal intrusion?

Ms. STUNTZ. Oh, I do, sir—absolutely, it is. I agree with you.

Senator WALLOP. I thought the President said that what he was trying to do was have less mandated by the Government?

Ms. STUNTZ. I believe that he is. But I think that, quite honestly, it appears to us—and I would agree with Senator Jeffords on this—that if we want alternative fuels to really come into the marketplace in a significant way in the near term, there is a market failure, you can call it, or a chicken-and-egg problem, that the fuels will not be there until the cars are there; or the cars will not be there until the fuels are there.

We do not know that it is necessary that you have to mandate both, but if we do not get one of them out there to get a pull in place, we are not going to get the other one. And that is what motivates this provision, basically.

The CHAIRMAN. Will the Senator yield at that point?

We cannot get all of these alternative fuels at once, can we? At the same time? Your idea is to have the market pick one. And how do you get a test on any one, unless you get a whole system? And how do you get a whole system for all simultaneously?

Ms. STUNTZ. Our idea is very definitely not to pick one. And I do think that all will develop simultaneously. Because there are going to be different usages. And I think as Congressman Andrews said, I think in many parts of the country, CNG is going to be very attractive. In many areas you will have aggressive marketers. And it is not just Texas. It is places like New York where you have one of the leading utilities in getting their fleets—garbage truck fleets, for example—to switch over to CNG.

But there are going to be other parts of the country where other fuels make sense. You are going to have heavier-duty trucks, busses, garbage—that CNG makes more sense. Because they can handle the bigger—the canisters necessary to hold the gas—light-duty vehicles, probably the alcohol fuels will make more sense because they require fewer changes and you are not compromised as much by weight.

I think electric vehicles are certainly going to come in place in California, and maybe Houston—areas that have a real premium on virtually no emissions. Thus, I think they will develop simultaneously, and probably in different niche uses.

Senator WALLOP. Well, as I understand it, the administration's proposal is to expand on the alternative fuels provision in the 1990 Clean Air Act, and that the fleet proposal is an alternative to CAFE.

Ms. STUNTZ. I do not know that it is necessarily an alternative to CAFE. We think that it is a fundamentally better approach to take if what you really are interested in is decoupling oil and the transportation sector.

Senator WALLOP. Frankly, the thing that worries me, on the top of the expensive owners' requirements, in the Clean Air Act—that this new proposal is being made before the Clean Air Act alternative fuels and fleet programs have been implemented.

Your proposal would expand the Clean Air Act both within the 22 areas that were mandated in that Act to fleets of 10 or more vehicles and nationwide, compared to fleet owners with 20 or more

vehicles. And your expanded proposal would encompass about 130 cities, where about two-thirds of all Americans live.

It just strikes me that common sense would suggest the advisability of some experience within the 22 nonattainment areas, before further intervention in the marketplace. This is a pretty astonishing mandate. And not knowing what it is going to do, how it works, how it can be implemented—just strikes me as wrong. But perhaps the administration has made an analysis of this. Have they?

Ms. STUNTZ. We have done an analysis of this and other alternative fuel program proposals that were made during the course of developing the National Energy Strategy, including some that resembled Senator Jeffords——

Senator WALLOP. What does the analysis encompass? What was analyzed?

Ms. STUNTZ. We analyzed proposals, for example, to impose the blend mandates, basically along the lines that Senator Jeffords is proposing.

Senator WALLOP. From what perspective was the analysis made? I mean, was it as to deliverability or the feasibility or the economic consequences to small business?

Ms. STUNTZ. Yes, sir. We looked at cost. We looked at environmental emissions, we looked at fuel availability, vehicle availability, burden on fuel manufacturers, burden on fuel distributors—a whole host of those issues.

Senator WALLOP. Well, I have to say that if you did it from the perspective of the burden on fuel administrators—not administrators, Freudian here, we have too much Government in the room—but on fuel distributors, then you answered my question.

All that is required is to just get another tank, but that is of no small consequence to a small businessman. Hopefully there will be some of those still around after this Government gets done.

[Laughter.]

Senator WALLOP. I mean, does the analysis talk about how a small businessman or woman can?

Ms. STUNTZ. We did look at the costs of the distribution systems and the infrastructures that would be required.

I would hasten to add that this does not mandate any particular infrastructure or distribution system. And for that reason, the Chairman is——

Senator WALLOP. No, but here is what happens.

You mandate the program, do not mandate that any one individual participate in it. But if the only folks that can are those with huge capital resources behind them, you soon just kind of drive out the smaller business competitor because he simply does not have the financial resource to compete with the larger infrastructures in the distribution system.

So it is my hope that at least you can make those analyses available to the committee that we might see that——

Ms. STUNTZ. We will do so, sir.*

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* The information referred to has been retained in the committee files.

The CHAIRMAN. Senator Wirth.

Senator WIRTH. Thank you very much, Mr. Chairman. Ms. Stuntz, thank you very much for being here. You are very patient with all of us.

Mr. Chairman, I agree with you on the enormous promise of this, particularly in the area of natural gas, and as you know I have a natural-gas-fueled vehicle of my own which does run beautifully, works perfectly. It is clean, it is cheap. It does everything that one would want to have in a fuel. And I think to encourage that is exactly what we want to do.

I think there has been a great deal of experience on this front. It is my understanding that New Zealand, the Australians, the Italians have very, very broad national experience.

And I guess I would not share the feeling of my distinguished colleague from Wyoming that this is an astonishing requirement. I would only say I think it is very timid. I am astonished by the timidity of the administration in pushing this, and wish we could get you to do a little bit more on that front. But I do appreciate your stepping out.

Could you—before I have just one question. But before that, did you, when this discussion of various ethanol fuels, there is a great deal of work, Linda, going on at the Solar Energy Research Institute on the conversion of cellulose to ethanol. And that would solve the problems of giving up hogs in Iowa and giving up all the corn to ethanol, if we could figure that out. And I think that is now becoming a very promising—at least they suggest that that is very promising. And I know that you are familiar with that.

The CHAIRMAN. You would lose a lot of your political support if you are using cellulose instead of corn.

Senator WIRTH. Why? You use the corn, then you use the stocks of the corn. That is a pretty good deal. You get double-hit, rather than just one. You can sell the corn for the hogs, and sell the cellulose for driving Senator Wallop's car. That is a pretty good deal.

[Laughter.]

Senator WELLSTONE. And then furnaces that burn on the corn cob.

Senator WIRTH. That is it.

Can you tell me—we had asked before, and had not gotten data back—is the provision on alternative fuels and fleet use in the National Energy Strategy similar to what the President had initially proposed in the Clean Air Act? Or is it not as broad as his initial proposal in the Clean Air Act?

Ms. STUNTZ. I do not know where that answer is. I signed it out, and hopefully it is on its way to you.

But my recollection is the President's original Clean Air Act did not have a fleet proposal in it, I do not think. It was a general sales mandate, as I believe you recall, Senator, in nine cities, about 1 million vehicles.

Senator WIRTH. And how would that compare to your fleet proposal?

Ms. STUNTZ. Well, this is——

Senator WIRTH. It was more ambitious than yours?

Ms. STUNTZ. Well, some would call it more ambitious, some would call it more onerous.

Senator WIRTH. Just in terms of pulling the market, going back to your point, where do you start with the availability of fuel or the vehicles?

Ms. STUNTZ. It is a different proposal. It would have produced a similar number of vehicles being in use. But I think we did learn some things from the Clean Air Act experience as to the efficacy of trying to dictate numbers, you know, production mandates and numbers of vehicles in the cities.

Senator WIRTH. Oh, I agree with that. And I think the notion of setting a kind of a fleet standard and doing it that way where you are creating a market solves that problem. And I think you did the right thing in making that transition.

The only point of my question is the——

Ms. STUNTZ. Fewer vehicles.

Senator WIRTH. Is the program in the administration's energy bill as ambitious in terms of pulling the market as the President's initial Clean Air proposal? And I do not think it was. But I know we are getting back from you a response on that front.

Ms. STUNTZ. Right.

Senator WIRTH. Also, I had asked Assistant Secretary Davis a variety of questions on other alternatives. And I would appreciate it maybe if you could check back on that. There were a number of things that had been suggested by the Department of Energy that did not end up in the National Energy Strategy. And he was going to send those to us with numbers on them, and getting a sense as to whether or not we had to include many of those in the bill.

Anyway, Linda, thank you very much for being here.

Mr. Chairman, thank you very much.

The CHAIRMAN. Thank you, Senator Wirth.

Senator Wellstone.

Senator WELLSTONE. Thank you, Mr. Chairman.

Secretary Stuntz, I came in late and did not get a chance to hear your testimony. And this morning we had a discussion where we talked about the distinction between the technical part and values. And I wrote some—just some things down here, some notes, that I think will lead up to a question.

This whole idea of self-sufficiency, this concept, the concept of energy independence. For example, I come from a State, Minnesota, in the Midwest. We are a cold-weather State. We are at the other end of the pipeline. We are not an energy-exporting State. We are an energy-importing State. Our energy bill is about $7 billion a year—I think about 85 percent of that money leaves the State, not to come back.

I mean, we are interested in how we can become more independent. We are interested in how we can keep some of that capital in our State, so on and so forth.

I guess that is where ethanol, for example, comes in from wood or other biomass. That would be, for us, an important alternative energy source.

So I guess my question—and I also would be interested in your response to this, Mr. Chairman—is I am interested in the whole idea of equity in energy investment. As we think about the Federal role working with State and local communities I want to see some equity in that investment.

And I just wonder what you think of the idea of demonstrating—being able to demonstrate—that alternative fuels make sense, I mean, indigenous to different regions. In other words, different fuels and different regions decentralized with the idea that different regions and different States have the opportunity to become more independent and control their—if you will—energy destiny, much less their economic destiny, with the idea that grants go from the Federal Government back to the States for these kinds of—at the very minimum—demonstration projects.

Does that make sense as a concept, as a direction to go in? Is that part of what you have in mind?

Ms. STUNTZ. I think that it is. If I could say two things on that.

First, we—the Federal Government provides a great deal of support now through UMTA, for purchases of vehicles. And I am not a representative of UMTA, so I do not want to get too far on this. But basically, I think we can use that leverage that the Federal Government already provides in helping localities meet their mass transit and other needs to move them toward the direction of alternative fuels. And I think that is exactly what we will do.

But I have to say, on this issue of self-sufficiency and energy independence, we—and I guess this is where I would have to respectfully differ with Senator Jeffords—I do not think that people should be under the illusion that somehow using all the energy—producing all the energy you use in a given State somehow insulates you from the vagaries of the world oil market or world energy markets. It will not happen that way.

Look what happened to the price of ethanol, for example, last August—and methanol, and other competitors with gasoline when the price of gasoline and oil went up after the Iraqi invasion.

Those things will go up in price. That is why there is not a single answer for reducing our vulnerability to oil price shocks, CAFE or anything else. The point is we need a combination of supply and demand-side measures that work together to help reduce—make us more efficient as an economy, reduce the use of oil in our economy—or the economy of Minnesota. And that is the way to keep capital at home and to better insulate yourself. You can never totally isolate yourself, but you can better insulate yourself from those economic disruptions.

Senator WELLSTONE. Well, I am certainly not talking about heaven on earth with energy policy. I understand full-well what you are saying. But what we want to do is reduce that dependency.

And what I thought I heard you say—and it really captured, you know, my attention—was this notion of different alternative fuels in different regions. I heard you state that loudly and clearly. And that is one of the things that I am very interested in, Mr. Chairman. Because I really think it makes a great deal of sense, as we think about what role we play here—I mean this committee is a committee I have always wanted to be on. I really look forward to working with the leadership of this committee.

But I really think that this idea of equity in energy investments, so that different regions will have this opportunity to at least move in the direction of reducing their dependency, so that in some places, ethanol, for example, makes a great deal of sense. And in others, it does not. I mean, that is my concept.

Ms. STUNTZ. I agree with that.

The CHAIRMAN. Well, if the Senator would yield.

You know, you talk about equity, we have a 60 cents per gallon subsidy for ethanol right now; no similar subsidy for natural gas; no similar subsidy for—I do not know about methanol—but in terms of at least equal sort of subsidy, that is a pretty big inequality, is it not?

Senator WELLSTONE. Well, Mr. Chairman, I am not—we could talk about ethanol, we could talk about wind, we could talk about solar—I am just simply want to lay out the concept that different regions—I use that as but one example—different regions look at different indigenous sources. And I think it is going to be important for us to think about it that way, and to fashion public policy that will enable different regions to move down that road of independence.

We will argue the subsidy part later. Thank you.

The CHAIRMAN. Linda, thank you very much for your usual good testimony.

Next, we have a very interesting panel—with David Lefever, who is executive director of the National Association of Fleet Administrators, from Iselin, New Jersey; Ms. Lana R. Batts, who is senior vice president for Government affairs of the American Trucking Associations; T. Boone Pickens, who is general partner of Mesa Limited, Partnership, from Dallas, speaking on behalf of the Natural Gas vehicle coalition; Bob Krueger, who is Commissioner of the Railroad Commission of Texas and a former outstanding member of the House of Representatives; and Eric Vaughan, who is President of the Renewable Fuels Association in Washington, D.C.

So why do we not begin. Lady and gentlemen, we always put our statements in the record, as if read in full—and they will be very carefully read. And we would like for you to summarize so we can get the salient points so we can have time to have questioning.

Mr. Lefever, why do you not begin?

STATEMENT OF DAVID LEFEVER, EXECUTIVE DIRECTOR, NATIONAL ASSOCIATION OF FLEET ADMINISTRATORS, INC.

Mr. LEFEVER. Thank you, Mr. Chairman.

And following up on that suggestion, we have submitted a rather lengthy, written statement, at your request. I do not even have a copy immediately in front of me.

Instead, I am going to try to highlight just a couple of issues that are of special concern to fleet managers.

The National Association of Fleet Administrators represents members who manage fleets of cars, vans, and light trucks for corporations and Government agencies. Our members are responsible for about 2.7 light-duty vehicles of that type. We have heard a lot over the last few months about what Government and others would like to do with fleets, to regulate fleets. And we really appreciate this opportunity for fleets to provide some information in return.

NAFA members have been studying and testing alternate fuels for years. But of course the greatest attention has taken place the last 2 or 3 years with all the research into the Clean Air Act. Frankly, our members are quite distressed that the complex fleet

provisions of that Clean Air Act which were hammered out just a few months ago, are already being thrown into confusion with the possibility of new and conflicting legislation affecting fleets.

We sincerely believe that efficient implementation of the Clean Air Act alternate fuel requirements is really being jeopardized by this new energy proposal. Mr. Chairman, a few moments ago, you made reference to how long it takes fleets to order these vehicles and get them in the works.

And, in fact, we have been working with our members to help them to plan the strategies they need, to plan the construction that they must take, to look at the financial considerations that they must change in order to comply with the Clean Air Act.

Right now, fleets cannot commit to capital expansion, new garages, and fueling facilities, project operational costs, when we are not sure, at this moment what, if anything, this law is going to change about the direction that Congress just gave us a few months ago.

One of our members stated in a letter to this committee just about a week ago, "Quite frankly, I cannot risk implementing a long-range plan to meet energy and environmental requirements, when not one person can honestly say they know what awaits us. I cannot subject my employer to penalties of $100,000 per violation because purchase made, changes implemented, or equipment and buildings purchased may not meet new legislative guidelines of 1995." And that really is one of our greatest concerns.

I think a second concern is we have substantial doubt that this energy plan is really going to achieve the reduction in foreign oil use—or any oil use—that the Department of Energy has predicted. There are only 7 million fleet vehicles in America, by the most generous—light-duty vehicles—by the most generous estimates we have ever been able to see.

Somehow, the Department of Energy thinks that with some magic, that 7 million is going to spawn 90 million by 2010. And we frankly have not seen any indication of how that is going to happen.

We would put out, there was discussion earlier, about the President's initial Clean Air Strategy. We supported that idea because it was going to have alternate fuel vehicles apply to everyone in America. And we still believe that if Congress really wants to make this a major priority, you can do the same thing you did with other critical, car-related issues.

When you felt fuel was being wasted, you mandated fuel-economy for all cars. You mandated safety belts for all cars. You mandated a switch to unleaded gasoline for all vehicles. And, in fact, NAFA members really feel that something like that, or a look into other options that really would affect all vehicles, could dramatically reduce our foreign energy dependence a lot more than just the fleet requirement.

Briefly, I make just two other very brief points.

We are especially concerned about any mandate that would require conversions. Our members have had a lot of experience with converting vehicles from one fuel to another. If someone voluntarily wants to do that, we think that is marvelous. But the experience

has not been good universally. And that is probably the greatest nightmare that our members fear.

Finally, I think we encourage you to preserve the fleet provisions and the alternative fuel mandates of the Clean Air Act. We think there are many things that could be done, far beyond energy tax incentives. There are many incentives that could be offered to fleets to encourage those who are able to do so, to voluntarily move to alternative fuel sooner. We include a couple of pages of possibilities—with our written testimony—and we think that is another possibility you might like to consider.

We really look forward to working with you and to answering any questions the committee might have.

[The prepared statement of Mr. Lefever follows:]

PREPARED STATEMENT OF DAVID LEFEVER, EXECUTIVE DIRECTOR, THE NATIONAL ASSOCIATION OF FLEET ADMINISTRATORS

Mr. Chairman, Members of the Committee: On behalf of the National Association of Fleet Administrators, I am pleased to participate in this hearing on the alternative fuels provisions of the Administration's proposed National Energy Security Act, S. 570.

The National Association of Fleet Administrators (NAFA) is the professional organization of vehicle fleet managers. The Association includes more than 2,200 members In the U.S. and Canada who are responsible for 2.7 million passenger cars, minivans and light duty trucks. Most members manage fleets for corporations, covering the full range of manufacturing and service industries. Other members serve educational institutions, utility companies, law enforcement agencies and government bodies.

A centrally-managed fleet of employer provided vehicles represents a significant corporate investment integral to daily operations and corporate financial well being. Fleet automobiles, minivans, vans and light trucks are used to transport sales representatives, repair and service personnel, and executives on company business.

Fleets are not uniform in function, vehicle mix or operating requirements. Fleets may include: a car provided to a salesman by Hallmark Cards; a minivan for a Xerox technician; a cargo van provided to a delivery agent by Federal Express; a patrol car provided to a policeman by the City of New Orleans; a repair truck provided to a telephone repairman by Bell Atlantic; a tunnel jeep provided to an employee by the Port Authority of New York and New Jersey. The common thread is that the vehicle is an essential tool in carrying out the business of the fleet owner.

Fleets also include the truck driven by your plumber, your florist or other local small business. The only employee-driven vehicles not included in the all encompassing term "fleet" are vehicles which are owned by the employee, rather than provided by the employer. While most companies prefer to provide vehicles to their employees, other companies most notably IBM—rely almost exclusively on the use of employee-owned vehicles.

Many NAFA members have been in the vanguard of the development of alternative fuel technologies: a number of fleets are presently experimenting with the use of alternative fuel vehicles; Federal Express is engaged in a major demonstration project with the State of California and the U.S. Department of Energy; and others such as the Los Angeles Times have operated alternative fuel vehicles for years.

The Clean Air Act Amendments of 1990 mandated serious and costly changes for certain segments of the fleet industry to switch to alternative fuels. For more than two years, decisions by fleets on the use of alternative fuels were placed in limbo while the Congress debated the scope of an alternative fuel fleet program as part of the Clean Air Act. Once the Clean Air Act was signed into law, fleets again began expending many hours and resources to incorporate the CAA requirements into their long range fleet utilization plans.

Now, with the introduction of the National Energy Strategy Act by the Administration, fleets have no idea whether the CAA and the EPA will guide fleets, or if the National Energy Strategy, with the DOE in charge, will set the standards. Fleets, which are trying to plan for CAA implementation, do not know whether or not to proceed. Should they start, stop, or wait for the next alternative fuel fleet initiative which results if alternative fuels proponents are not happy with the outcome of the NES!

The proposed National Energy Strategy Act again places the entire national transportation and distribution system on hold. Fleets must again delay decisions on the type of equipment to purchase. Fleets have no ability to forecast long range costs or to even determine if they will be able to continue to operate because of the stringency of the NES. Fleets will not commit limited resources to purchasing vehicles which may not meet next year's fuels or environmental requirements. Fleets cannot commit to capital expansion, such as new garage and fueling facilities, which may not meet future energy or environmental laws related to fuel storage, handling or usage. Fleets cannot project operational costs when they have no idea if new vehicles will be manufactured or old vehicles must be converted. Fleets cannot train mechanics when they have no idea what they will be required to fix and maintain.

Fleets are again facing the environmental and economic dilemma that they thought had been addressed in the Clean Air Act. As one NAFA member put in a letter to this Committee:

> Quite frankly I cannot risk implementing a long range plan to meet energy and environmental requirements when NOT ONE PERSON can honestly say they know what awaits us. I cannot subject this company to possible penalties of $100,000 per violation because purchases made, changes implemented or equipment and buildings purchased may not meet new legislative guidelines and may become violations in 1995.

Fleet managers urge Congress to leave the Clean Air Act and its innovative concepts intact. The positive steps taken in the Clean Air Act towards greater use of alternative fuels should not be cannibalized by the National Energy Strategy. The NES should not mandate a nationwide alternative fuels program that eliminates the positive attributes of the Clean Air Act.

The solution is to maintain the Clean Air Act's emphasis on a balanced incentive approach. Whatever additional movement to alternative fuels can and should be achieved by inducing greater voluntary participation by both fleets and private vehicle owners.

Energy security and environmental protection are separate but related objectives. In the case of a fleet program, the mechanism for meeting the objective is the same the use of alternative fuels by fleets. The NES raises all the confusing issues which Congress resolved in the CAA. The same practical concerns that were addressed and resolved by the Congress in the CAA do not change because the focus has shifted from the environment to energy.

The practical concerns considered in the CAA and raised once more in the NES, include:

Vehicle availability: Requiring fleets to purchase vehicles without any corresponding requirement that vehicles be available from vehicle manufacturers dooms a fleet program to failure. Fleets utilize a wide variety of makes and models of vehicles to conduct the operations of their businesses. For example: in 1990, fleet vehicle orders for automobiles included more than 80 models. Other fleet vehicles include such limited-use vehicles as forklifts, tunnel jeeps, shovel loaders and street sweepers. The NES would subject a fleet operator to penalties of $100,000 per violation because vehicle A manufacturers failed to produce vehicles.

Fuel availability: Fleet vehicles must use fuels without any requirement for fuel suppliers to make the fuel available and at competitive prices. Fleet-only mandates will not create sufficient demand for alternative fuels to encourage the public availability of fuels, and centrally-fueled fleets will become captive to fuel suppliers, such as natural gas.

Conversions: Absent the availability of vehicles in the variety needed by fleets, conversions become the only option. Conversions are not acceptable for most fleet operations because of cost, performance and reliability. Conversions are extremely expensive. For example, in late February a major national fleet was quoted a price of more than $3,000 per vehicle to covert 100 cargo vans to CNG. The experience of fleet managers with the performance and reliability of conversions has been almost uniformly unacceptable. Last year, the American Gas Association provided NAFA with a list of those companies and government entities which were using CNG-converted vehicles. NAFA contacted each of these fleets, and in many cases, the fleet reported that they had a bad experience with these vehicles (see attachment 1) and had discontinued operating the vehicles in question. Additional concerns with conversions, include increased vehicle pollution, lack of available service and maintenance, voided warranties, lost cargo space, and reduced resale value.

Central fueling: Absent an extensive public fueling infrastructure, a fleet program is only practical for those fleets with central fueling. Extending a pro-

gram to fleets that are "capable of being centrally fueled" creates uncertainty, confusion and lack of uniform interpretation. The term "capable of" is subject to such broad interpretation that many scattered sales and service fleets, which rarely return to a central location, would inadvertently be included, requiring investment in central fueling facilities by companies which previously never had fueling facilities. Such investments would often be impractical because of land acquisition costs, zoning restrictions and nature of the fleet operation.

Congress resolved each of these practical concerns in crafting the clean-fueled fleet program. The NES, however, does not reflect the balance achieved in the CAA between mandatory and voluntary compliance, burden sharing between vehicle manufacturers and purchasers, and between alternative fuel providers and users.

The NES requires a reopening of the Clean Air Act, a controversial initiative that took years to enact. And, to use legislative sleight of hand to avoid reopening the Clean Air Act, leaves fleets subject to different requirements in two different federal laws. The NES presumes that Congress was mistaken in what it agreed to only months ago. The NES would force fleets to acquire alternative fueled vehicles without any requirement that manufacturers build the vehicles or that fuel companies provide the fuel. Expensive and impractical conversions of gasoline and diesel vehicles to alternative fuels would be required.

Fleet managers support the goals set out in the National Energy Strategy, including increased energy and economic efficiency. Fuel economy is a primary consideration for a fleet manager because fuel costs are a major component of operating costs. Light-duty fleet vehicles are more fuel efficient than the average vehicle because fleet vehicles are newer and better maintained.

Fleets place a greater importance on fuel economy than do individual vehicle owners when making new vehicle purchases. For the consumer, when gasoline prices are down, the new car buyer places less importance on vehicle fuel economy. However, to a fleet manager, concerned about the bottom line, fuel economy always is important.

While the NES targets fleets as part of the national strategy to reduce dependence on foreign oil, the NES does not consider the fuel efficiency and availability of replacement fuels. Many fleets question whether the effect of the NES will be to replace dependence on foreign oil with a dependence on foreign sources of other fuels. Are there adequate domestic supplies of methanol and CNG? Should we rely on optimistic projections of alternative fuel advocates? is the hard data available to convince the Congress that domestic supplies of these fuels exist and will in fact reach the end user? Will natural gas distribution lines never again run dry, as they did in parts of Tennessee in late 1989 or in Ohio in the 1970's? Do fleet managers and the American public have reason to be concerned when a spokesman for the Office of Technology Assessment testified before this Committee that the use of natural gas may not be in the best interests of energy security because increased demand would force the U.S. to import natural gas?

Fleet managers are perplexed that, while the stated intent of National Energy Strategy is reliance on the marketplace to achieve the objectives of the strategy, fleets alone have been the singled out for regulatory mandates. The Administration and the Department of Energy are putting the full burden on fleets even though fuel efficiency of private fleets suggests that they are not a clear source of the problem confronting the Administration.

The Department of Energy has erred in its assumption that a fleet-driven alternative fuels program can provide the same reductions in oil consumption as other proposals rejected by the Administration, such as changes in CAFE standards.

The Congressional Research Service has estimated that in order to meet the DOE's projected displacement of 2 million barrels per day by the year 2010, 93 million vehicles would have to be alternative fueled by 2010.

Where will the 93 million vehicles come from when all light duty fleet vehicles, in fleets of ten or more vehicles, represent less than 5% of all light duty vehicles in use nationwide. There are only an estimated 8.34 million light-duty fleet vehicles nationwide and these include daily rental and emergency vehicles which would be exempted under the Administration's proposal, as well scattered sales vehicles which are not centrally fueled.

The critical question is: how does the DOE project that a few million fleet vehicles will grow into 90 million vehicles. According to the CRS, 40% of new vehicle sales to every individual and corporation in American, beginning in 1996, would have to be alternative fueled to meet the 90 million target by 2010.

It is difficult to imagine that a fleet program would generate the necessary penetration into the consumer vehicle market.

The Committee needs to be concerned that the DOE projections are not realistic and that a fleet-based alternative fuels program is not an adequate option in lieu of other fuel economy measures.

There is a perverse sense of logic involved when claiming the Strategy is market oriented because it does not mandate vehicle production by manufacturers nor fuel availability by fuel suppliers, but justifies mandatory vehicle purchases by fleets. The logic is even more perverse when a captured fleet market is created for manufacturers and fuel suppliers to feed on, if and when they choose, and when their appetites are satisfied, there is no recourse for fleets to obtain vehicles and fuels.

The CAA created a practical framework for moving the country away from the use of petroleum-based transportation fuels to the use of alternative fuels. if this framework is allowed to be implemented, it would provide the basis for the potential replacement of hundreds of thousands of gasoline powered vehicles with alternative fuel vehicles.

Alternative fuels were as important to the clean air debate as they now are to the development of a national energy strategy. If the framework that was created in the Clean Air Act is allowed to evolve as Congress intended, the benefits of alternative fuels will accrue to both the environment and to national energy security. However, to consider mandates that go beyond those of the CAA is simply not practical nor feasible.

As Congress determined last year, you cannot force technology, infrastructure development and consumer acceptance at a pace any greater then the pace outlined in the CAA. To impose more stringent mandates or faster implementation requirements presents the potential for a complete failure of alternative fuels as a national transportation fuel.

The clean fuel fleet program in the CAA was crafted with a real purpose in mind. For the first time, Congress established a policy which allows the country to embark on a well-defined path toward the potential widespread use of alternative fuels. The roadways of federal energy policy are littered with the remains of failed energy initiatives.

Our recommendation to the Senate is that the CAA be built on by encouraging increased participation in the use of alternative fuel vehicles by both fleets and private vehicle owners through innovative incentives. Incentives which the Committee might consider include:

Permit the trading of alternative fuel credits between mobile and stationary sources.

Provide a per vehicle tax credit for alternative fueled fleet purchases, patterned after the successful Canadian program.

Allow the individual taxpayer a sales tax deduction for the purchase of new and used alternative fuel vehicles.

Provide a prospective preemption of state and local taxes on alternative fuels.

Provide prospective exemption of highway tolls on alternative fuel vehicles.

Utilize the Leaking Underground Storage Tank Trust fund to underwrite the costs of installing alternative fueling facilities at both fleet and retail locations.

Allow use of HOV lanes by all owners of alternative fuel vehicles.

Require fuel providers to underwrite the cost of new fleet alternate fuel facilities.

Require vehicle manufacturers to subsidize the incremental cost of alternative fuel vehicles.

Allow employers to provide a tax-free stipend to employees for commuting in an alternative fuel vehicle in lieu of a mass transit stipend.

Provide exemptions from CAA and NES trip permit and parking restrictions for companies who encourage purchase of alternative fuel vehicles by employees.

NAFA appreciates the opportunity to participate in this hearing. If our members can assist in your deliberation by providing you with additional information, we would be pleased to do so.

[Attachment.]

AMERICAN GAS ASSOCIATION,
Arlington, VA, December 15, 1989.

Mr. DAVID P. LEFEVER,
Executive Director, National Association of Fleet, Administrators, Inc., 120 Wood Avenue South, Iselin, NJ.

DEAR DAVID: The enclosed lists contain the company names of both utility and some of the larger fleets that have converted their vehicles to natural gas. We consider these companies listed to be in the forefront of the natural gas industry.

If I can be of further help, please call me at 703/841-8621.

Sincerely,

RICHARD M. IRBY III,
Vice President, Government Relations.

[Enclosures.]

41-663 0 - 91 - 3

Major Natural Gas Vehicle Fleets

- U.S. Postal Service —600 vehicles
- Pepsi —175 vehicles
- Miami International Airport —160 vehicles
- City of North Miami —140 vehicles
- Arizona State University —100 vehicles
- State of Oklahoma —96 vehicles
- Chicagoland Laundry and Drycleaners —83 vehicles
- City of Scottsdale —80 vehicles
- Barksdale Air Force Base —44 vehicles
- Coca Cola —25 vehicles
- UPS —10 trucks

National Association of Fleet Administrators, Inc.
NAFA
120 Wood Avenue South, Iselin, New Jersey 08830 (201) 494-8100

STATUS OF NATURAL GAS FLEETS
Cited by American Gas Association
As "Major Natural Gas Vehicle Fleets"

(Reported in sequence listed by AGA)

U.S. Postal Service
Contact: Paul Rosenak, Fleet Management 202/268-2000

For many years Postal Service has operated large number of 1/4 ton and 1/2 ton trucks on CNG, and is considering testing of similar vehicles by additional manufacturers. No experience with cars, and there are no plans to consider CNG cars.

[Called 1/8/90]

Pepsi
Contact: Cathy Gilmore, Fleet Manager 914/253-2049
Arnie Sivba, Purchasing Director 914/767-6619

Both report that Pepsi operates no CNG vehicles.

Perhaps some local, franchised bottler does.

[Called 1/8/90]

Miami International Airport
Contact: Mr. David Berger 305/876-0546

Operates 150 vehicles from sedans and pick up trucks to towtrucks, a dump truck, a step van, a cargo van, even a small crane. Operates own $150,000 pumping station. Range is no problem because most vehicles stay right at airport; however, since some vehicles idle many hours per day for radios and air conditioning, put larger tanks on those vehicles.

(Called 1/28/89)

City of North Miami
Contact: Mr. Ramus Efraim, supervisor
305/949-7364

CNG fleet consists of pick up trucks, open tops, dump trucks which used to run on gasoline..... and is planning to convert some trucks from diesel.

Used to have some sedans; however, there was too little room for the CNG tanks... so the City of North Miami switched back to gasoline cars and limits CNG to trucks.

[Called 1/8/90]

Arizona State University (Tempe, AZ)
Contact: Carl Golnik
602/965-3496

The University does not have a single CNG vehicle operating today. As of today, refueling facility is only halfway constructed. University plans to convert approximately 100 of 500 vehicles. The vehicles which will be converted to CNG are mostly motor pool and physical plant vehicles, plus 9 trams which carry students around campus. Plan to convert very few cars (maybe Celebrities and Cavaliers) and concentrate instead on pickups and larger.

[Called 1/8/90]

State of Oklahoma
Contact: Steve Dwyer, State Fleet Manager (Member)
405/521-2206

CNG fleet is 75 school busses and 17 other vehicles. A total of 96 vehicles will ultimately be converted. Several pickup trucks, a wrecker, 15 passenger vans and other vehicles have been used for some time with acceptable results. Some power loss, small range. School bus conversion kits work great, the rest are more difficult because of space limitations or "not yet state of the art conversion kits." Specific vehicles are chosen because they can tolerate the small travel range of CNG converted vehicles. This is a 2-year test, funded from oil overcharge money.

First small test of cars is just underway with only three 4-cylinder Chevrolet Celebrity cars. Says cars are very difficult to convert because of so little space in the engine, and loss of trunk space for fuel canister. *(Continued on next page)*

Oklahoma (Continued)

Notes small per-gallon equivalent cost for CNG in Oklahoma today. Noted, however, that similar cost savings for LPG disappeared last week, when the cost for LPG increased from 47 cents per gallon to $1.12 per gallon just last week.

[Called 1/8/90]

Chicagoland Laundry & Drycleaners
Contact: Jerry Lambert
312/342-9595

Did operate around 90 vehicles for a couple of years. Today, does not operate any vehicles on CNG. Had "major, major problems" with the compressor unit and, when the company relocated, they decided "not to bother with it" because of compressor problems. Vehicles were dual-fuel with gasoline and all now operate on gasoline.

Drivers did not mind the CNG for the walk-in trucks, and although there was some power loss on longer runs, it was fine for normal use and a few of the drivers liked CNG better. But because compressor headache was so great, they now operate all the vehicles on gasoline only.

[Called 1/26/90]

City of North Miami
Contact: Hal Hoover
602/391-5570

Operates 92 vehicles on CNG today -- all dual fuel with gasoline. Expects to add 25 more vehicles within next three months. Mostly pickups, vans and sedans.... about 25 are '83 Fairmont, '88 Chevy Caprice, '85-86 LTDs. Operate own maintenance and fueling. City started with dual fuel CNG in 1982 for reasons of air quality and cost savings. Vendor did first conversions and trained City employees, so city does their own conversions today. Vehicles operate in limited range.

Police cars were originally on dual fuel, but switched back to gasoline alone because of small range.

[Called 1/8/90]

Barksdale Air Force Base (Louisiana)

Contact: Sgt. Walker - superintendent
318/456-3947

Did conduct a test with CNG on busses, street sweeper, etc. but test is over and vehicles are being removed. Fleet does include regular staff sedans and some pick up trucks, all dual-fuel with gasoline. Most of the time the vehicles are operated on gasoline because of problems with driving range (CNG has to be refuelled too often), driver reluctance to fuel both CNG and gasoline tanks, and driver apprehension about operating because of some serious maintenance problems. Air Force mechanics maintain the vehicles but have very little experience with CNG so things go wrong. Conversion was made by vendor who supplied vehicles.

[Called 1/26/90]

Coca-Cola
Contact: Carol Hunerwadel, Atlanta
404/676-2392

The national Coca-Cola fleet does not have any CNG vehicles. Perhaps the AGA was referring to some local bottling company.

[Called 1/8/90]

United Parcel Service
Contact: John Stark, Brooklyn Union Natural Gas
718/963-5554

United Parcel Service converted 10 of their big, brown "package trucks" to dual fuel CNG/gasoline in late 1989. According to John Stark at Brooklyn Union Natural Gas (which is working with UPS on the 2-year study) the vehicles are being operated solely on CNG. Since vehicles have been operating for only a few months, no conclusions available yet.

[Called 1/26/90]

The CHAIRMAN. Thank you very much, Mr. Lefever.
Ms. Batts.

STATEMENT OF LANA R. BATTS, SENIOR VICE PRESIDENT, GOVERNMENT AFFAIRS, AMERICAN TRUCKING ASSOCIATIONS, INC.

Ms. BATTS. Mr. Chairman, it's really a pleasure to appear before this committee to talk about the American trucking industry and the National Energy Strategy. As you are well aware, the American Trucking Associations represents all types of fleets, large and small, intrastate, interstate. And in fact, we have over 30,000 members if we include all of our State associations.

I am pleased to be here today to talk about what we have done in the past in energy and where we expect to go in the future. And I think when you look at the successes in the past in conservation and research in alternative fuels, you are struck by one word, and that word is "voluntary." We have done a lot of things through voluntary initiatives.

We think that the National Energy Strategy must be comprehensive in structure, that it must include exploration, that it must include conservation. And equally important, it must include alternative fuels. But there has to be a total perspective as to how we look at that.

We were very pleased when we saw your bill and what it did not include. We were pleased because it did not include unrealistic, unaffordable, and inconsistent mandates on alternative fuels. Any national energy strategy must adopt the alternative fuel mandates contained in the Clean Air Act of last year. And that includes clean diesel as an alternative fuel.

As David indicated, trucking companies, manufacturers, and our fuel suppliers are already at work trying to meet the standards in the Clean Air Act. And it is our concern that if this debate is opened up again, that all of that work will go on hold because no one will want to make an investment if they do not know what they outcome is going to be 6 months, 9 months, or maybe even longer.

I think if we understand what has happened to fuels in the trucking industry in the last 15 years. Primarily fuel accounts for between 5 percent and 15 percent of our total costs for each trucking company. The average trucking company last year spent over $1.5 million alone in fuel. On-highway diesel fuel is about 7 percent of all refined products, but it is still less than half of the number 2 middle distillate product.

Beginning in 1975, the trucking companies and their manufacturers got together to improve fuel economy. And over the years, we have improved our fuel economy 233 percent. I think it is important to understand that that improvement is greater than what was accomplished under the mandatory CAFE standards for light-duty trucks.

We have conserved a lot of fuel. And in fact, we believe that if the administration is really interested in conserving fuel, they would mandate the 55 mile-an-hour speed limit again. Did you know that for the trucking industry, it costs us for each 1 mile-per-hour faster that a truck goes, it costs us one-tenth of a gallon in

fuel? When you understand that these trucks are getting between 5.5 and 6 miles per gallon why a 10 mile-per-hour speed limit is one more gallon that we are using we should not have to.

Now, I think also if we are interested in real conservation in the trucking industry——

The CHAIRMAN. You cannot dictate that to your own trucks?

Ms. BATTS. That has been our policy for a long time, and we certainly will go any time. Now, there are a number of trucking companies that indeed have bought engines and have bought transmissions that cannot go faster than that. Our biggest problem is that the States will not enforce their own laws. Where the laws are enforced, that is the speed the trucks go; where the laws are not enforced, they go with the flow of the traffic.

But if you have got any ideas on how we get them to, I would be happy to listen to it, because it is my biggest bugaboo. Okay?

I think also if we are really interested in conserving fuel, we have to start looking at how do we make those trucks more productive. And as Senator Wallop is well aware, one way we can do this is by allowing trucks to haul more. And that is through the use of longer combination vehicles, which are allowed in 13 states and 5 turnpikes.

When it comes to alternative fuels, though, we have spent a lot of time and effort looking at not only alternative fuels, but alternative engines. And quite frankly, it has been rather dismal. We have not found anything that beats diesel and the diesel engine. Rudolph Diesel knew what he was doing back in the 1880's when he designed that engine.

We have also, though, supported the Alternative Mandated Fuels Act of 1988 and are working with the Department of Energy to finally start to put together alternative fuels on the roads in commercial trucks, to find out how they work and to find out if they work. Because we do not know.

Now I think it is probably obvious: commercial trucks are not cars. Diesel is not gasoline, and clean diesel is not reformulated gasoline. My problem is when I have listened to the previous speakers——

The CHAIRMAN. How do you make clean diesel?

Ms. BATTS. Clean diesel takes out the sulfur, starts to deal with the aromatics that we have got in the fuel. And you end up with, it is, basically it looks like diesel; it will run in a current diesel engine, but it meets the clean air requirements not only of the EPA, which we have to meet by 1994, but it also meets the 1988 standards.

The CHAIRMAN. You would have to put more oxygenates in it?

Ms. BATTS. Yeah, there are a lot of things that we are going to have to do. Quite frankly, we still have not—can I put a gallon of it sitting on here on the chair? No, I could not do that yet. But we are getting closer there than we have got with some of the other alternatives that everyone keeps talking about; there have been demonstrations.

When you look at commercial trucks, you will notice that they do not use those terms. They use cars, they use vehicles, they use the word fleets, but they do not use commercial trucks. That is because——

The CHAIRMAN. Clean diesel is an experimental fuel at this point?

Ms. BATTS. Clean diesel is an experimental fuel which is allowed under the Clean Air Act.

I think it is also important to understand that our relationship with our manufacturers and our fuel suppliers is substantially different than it is for the automobile user. We work hand in glove.

If Lana Batts decided to start a truck line—I do not know why I would want to, but if I wanted to start a truck line tomorrow, I would sit down with a manufacturer and we would build the truck I wanted for what I needed from the ground up. We would spec that truck. We have a different relationship with our suppliers.

What we are looking for in the National Energy Strategy is something in which we give the educated consumer, that is, the trucking industry, options in how we want to use our fuels. We do not think that the National Energy Strategy should guarantee, should have a Government guarantee for the marketing of specific fuels. Thank you very much.

[The prepared statement of Ms. Batts follows.]

PREPARED STATEMENT OF LANA R. BATTS, SENIOR VICE PRESIDENT, GOVERNMENT AFFAIRS, AMERICAN TRUCKING ASSOCIATIONS, INC.

I. EXECUTIVE SUMMARY

I am Lana R. Batts, Senior Vice President for Government Affairs of the American Trucking Associations, Inc. (ATA). Thank You for the opportunity to appear on this distinguished panel and to testify on the National Energy Strategy (NES).

This testimony is submitted on behalf of ATA, the national trade association for the trucking industry. Through its 51 affiliated trucking associations located in every state and the District of Columbia, 10 affiliated conferences, and several thousand individual motor carriers, ATA represents every type and class of motor carrier in the country; for-hire and private, regulated and exempt.

As a major energy consumer, the trucking industry is vitally interested in the development of the Nation's Energy Strategy and the impact it may have on the trucking industry and the American consumers. I am proud to come before you today representing an industry that has a record of commitment to energy through voluntary improvements in efficiency, research, conservation and environmental responsibility.

The trucking industry supports the development of a National Energy Strategy which is comprehensive in nature; one that recognizes all aspects of energy are equally important. We are especially pleased to have worked closely with the Department of Energy over the years in conservation and investigation into new fuels and engines, and look forward to further expanding that relationship in the future.

We believe that a comprehensive energy strategy must seek energy independence through identifying new domestic petroleum reserves, encouraging the use of alternatives, and the more efficient use of existing petroleum resources.

The trucking industry fully supports the following energy initiatives including:

The environmentally responsible exploration and development of domestic oil and gas reserves such as the Arctic National Wildlife Refuge.

Expanded efforts to develop advanced technologies such as gas turbine engines and low-heat rejection diesel engines.

The continued investigation and research into alternative transportation fuels.

Those provisions of this committee's energy legislation (S. 341) which provide for government assistance in the development and commercialization of technologies for use in transportation.

We cannot, however, support provisions of any energy strategy which:

Direct 10 percent of imported oil into the Strategic Petroleum Reserve. This strategy is a thinly disguised oil import fee which is really a hidden tax and subsidy that discriminates against the trucking industry and consumers alike in regions heavily dependent on imported oil such as the Northeast. New oil taxes, fees and mandatory set-asides must be rejected.@

Impose unrealistic, unaffordable, and inconsistent mandates for centrally fueled fleets to use alternative fuels.

In order for the transportation industry to continue to serve America's portion of the global economy without reducing our competitiveness, the NES must:

Include clean diesel fuel as an alternative fuel

Diesel is unquestionably the fuel of choice for all commercial freight transportation. A gallon of diesel fuel contains 13 percent more energy than a gallon of gasoline, and is between 15 and 35 percent more efficient than gasoline on the highway. Without assuring stability and a future for clean diesel fuel, all commercial freight transportation will be unable to continue to provide the service that the economy and consumers demand.

In the future we must have both stability and flexibility in engines, fuels, and emissions standards, and the only way to do that is to assure that clean diesel fuel is available. The case for clean diesel is entirely different than that for reformulated gasoline. Assuring a future for clean diesel technology is the foundation of an energy strategy for all commercial freight transportation.

Be consistent with the Clean Air Act

The future for engines, fuels and emissions has been clearly defined in the recent amendments to Title II of the Clean Air Act, outlining an aggressive program beginning in the next few years. The NES must categorically adopt all aspects of the fleet alternative fuels plan in the CAAA. Work has already begun to meet these goals. To reopen the debate now will only put all work on hold pending a congressional decision.

Recognize that commercial trucks are different than cars

Commercial trucks are very different than cars. Commercial trucks can not use the same alternative fuels as automobiles. Commercial trucks are not readily convertible or normally able to be flexible fueled vehicles. Government and private sector research for commercial trucks using alternative fuels is just seriously getting underway. Research for alternative fueled cars is much further along. Fleet users and engine manufacturers can not be expected to begin using unproven fuels and engines. To meet the proposed mandate in the NES, we would have to use engines we haven't seen and fuels which are not yet available.

Establish heavy duty vehicle partnerships

Incentives, instead of mandates, will do far more to promote and assure the use of alternative fuels. The NES should work to establish partnerships between engine manufacturers and fleets to investigate new fuels and engines in commercially viable truck operations. Further efforts to establish infrastructures are needed to assure fleets of an adequate fuel supply.

Balance conservation and alternative fuels

The NES should equally recognize and encourage improvements in conservation and efficiency of existing fuels as much as it promotes and encourages the use of alternative fuels.

Any discussion on fuel conservation must include longer combination vehicles. These highly productive double and triple trailer combinations presently used in 15 states under certain conditions have lower fuel consumption through operational efficiency and means fewer trucks doing more work. Savings of as much as 320 million gallons of diesel fuel per year could be realized through an expanded LCV program in suitable areas.

Our comments will focus on the principal components of the NES regarding transportation energy and fuels.

II. INDUSTRY BACKGROUND

The trucking industry is a significant part of the American economy, where in 1990, $257 billion in freight revenues accounted for 5 percent of the Gross National Product, and 78 percent of the freight bill in this country.[1]

In reality, the trucking industry is not a single industry, but rather many industries, large and small, regional and national in scope operating in and serving every city in America. In many cases, rural communities are dependent on trucks as the sole mode of transportation for essential goods and services.

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[1] Trucking Trends, 1990–1991. American Trucking Associations, Alexandria, VA.

The trucking industry also employs over 7.5 million people.[2] Because of the closely knit community of suppliers and manufacturers, the entire industry would be impacted with the adoption of the proposed fleet alternative fuel mandate in the NES. Many segments of the trucking industry operate both large multi-unit combination trucks and single unit straight trucks out of a single terminal, and would therefore be covered by the proposed alternative fuel fleet mandates in the NES.

Unlike automobile consumers who have no direct relationship with the manufacturer, trucking companies do. The trucking industry has a very unique relationship with the suppliers and manufacturers who build engines and trucks to serve our industry. Together they build the truck, specifying each individual component configured to the fleet customers needs. No two trucks are entirely the same. They may have different engines from different engine manufacturers, different transmissions, axles and fuel systems depending on the service of the vehicle.

Over the last three years, we have witnessed a steady decline in the number of Class III through VIII (10,000 lbs and above) trucks sold each year for an average drop of 7.5 percent, with an 18 percent drop in Class VIII vehicles (33,000 lbs. and up).[3] During that same time, twice as many trucking companies have gone out of business compared to the failure rate for all businesses.

Fuel is an integral part of the trucking business. In 1989, combination units (truck tractors and trailers) traveled 95.6 billion miles and consumed 17.9 billion gallons of fuel at an average cost of 1.11 per gallon.[4] Fuel is also a significant portion of the overall operating expenses with fuel costs accounting for 5–15 percent of all operating expenses.

Future fuels and engines in the trucking industry

Recognizing that one goal of the NES is to displace petroleum fuels from the transportation sector, we fully believe that some segments of the trucking industry will find the use of non-petroleum based alternative fuels to be economically beneficial. As informed consumers, they will make that choice after careful consideration and demonstrated fuel availability. That time, however, must be driven by the marketplace, not by an arbitrary mandate.

Even though these mandates focus on vehicles weighing 8,500–26,000 pounds, the integral nature of the industry with only a few manufacturers and a narrow group of vehicle purchasers, will result in the impacts being felt across the board, including the traditional heavy duty trucking industry. Trucking companies are presently operating at an approximately 2 percent profit margin, and can ill afford the tremendous investments necessary to begin using alternative fuels at the levels and timeframes mandated in the NES.

The industry has made an investment and commitment for improved quality diesel fuel to meet the upcoming 1994 Environmental Protection Agency (EPA) heavy duty engine emissions standards. Three years ago, the trucking industry consumers supported the landmark joint effort by engine manufacturers and petroleum refiners in proposing to EPA a regulatory process by which to improve future diesel fuel quality through the reduction in sulfur and the limitation of aromatics in the fuel.

Diesel fuel is different than gasoline

The case for clean diesel fuel is very different than the case for reformulated gasoline. Diesel technology has been the fuel of choice in the commercial trucking industry for over 30 years, and for many good reasons. In the late 1960's, the overwhelming benefits and efficiencies of diesel technology became apparent, and compression ignition diesel engines are now used almost exclusively in all commercial trucking fleets, and are all powered by diesel fuel. The NES mandates would ultimately force trucking companies to eventually abandon hundreds of thousands of diesel trucks in favor of some new and unproven engine and fuel.

Compared to gasoline, a gallon of diesel contains 13 percent more energy and is between 15 and 35 percent more efficient to maintain and use on the highway. As virtually the sole consumer of on-highway diesel fuel, the trucking industry constantly demands improvements inefficiency, reliability and durability for engines and fuels to increase productivity.

According to 1989 data, on-highway diesel fuel represents 7 percent of total U.S. refined products, and the commercial trucking industry accounts for well over 98 percent of that consumption. In fact, the majority of the #2 distillate demand

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[2] Ibid.
[3] Ibid.
[4] Highway Statistics, 1989. U.S. Department of Transportation. Washington, DC.

comes from the farm, off-highway, railroad, residential, industrial, and electric utility sectors.[5]

As virtually the sole consumer of on-highway diesel products, the commercial trucking sector has a vested interest in the future of diesel fuel. However, diesel fuel is a comparatively small segment of all transportation fuels.

In 1989, on-highway gasoline consumption was nearly 5 times greater than diesel fuel consumption.[6] According to recent data, automobiles account for approximately 73 percent of all transportation energy use, with light trucks (less than 10,000 lbs) accounting for an additional 18.1 percent. Therefore, heavy-duty trucks (over 10,000 lbs) accounted for approximately 14.5 percent of all transportation energy use.[7]

The diesel engine with clean diesel fuel is the most economical and efficient choice when compared to any alternative fuel. Based on the limited heavy-duty alternative fuel research to date, fleet consumers are not yet able to realize any benefits from using alternative fuels, only substantial penalties and losses in productivity, and immediate concerns about the liabilities and safety of using untested technology and fuels.

For example, most alternative fuels have less energy capacity than diesel fuel. If mandated to begin using alternative fuels, the industry would immediately realize a reduction in productivity resulting from having to reduce payloads to account for the additional weight of extra fuel and tanks to be legal to operate under existing weight limits. For the American consumer and economy, this means reductions in service, more trucks on the road, and unquestionably higher transportation costs to make up for the penalties of using alternative fuels.

Cars and lighter duty vehicles not dependent on payload and capacity are more capably suited for using alternative fuels than commercial trucks. These vehicles are readily able to be flexibly fueled, and could run on any combination of available alternative or conventional fuels. In the transition between petroleum and future alternative fuels, it is critical to maintain flexibility as experience with the new fuels, vehicles and infrastructure is gained. Unfortunately, commercial trucks are not generally suited for flexible fueling nor the transition between two fuels and infrastructures.

Current gasoline powered cars and light trucks appear to be the most suitable candidates to begin using alternative fuels in the near term, both at the consumer level and in some light duty fleets. They are best suited to deal with a developing fuel infrastructure in that they can be fueled by any combination of existing petroleum fuels and alcohol fuels or blends. Since the fuels are interchangeable, assured availability or operational range is not of a concern, and since they are lighter duty vehicles, payload is generally not of concern.

Such a case is not true for commercial truck fleets. Alternative fuels research for heavy-duty vehicles has focused on the development of dedicated vehicles optimized to run on a single fuel. Weight, safety, and size considerations prevent the use of two fuel systems for all but the smallest trucks operating in a limited area. Because the industry has inherently poor characteristics to transition between several fuels, development of alternative fuels is considerably further behind. Therefore, an assured future use and supply of clean diesel fuel is critical to the entire industry; manufacturers and users alike. Without it, the commercial trucking industry faces chaos in the ability to deliver what the American economy has demanded, and what it can afford.

Last year, the trucking industry, fleet administrators, and engine manufacturers worked together in the Clean Air Act reauthorization process to support an aggressive program for the introduction of alternative fuels beginning in 1998, while at the same time achieving substantial environmental benefits. This effort may soon be entirely undermined by the proposals in the NES, as everyone puts their research on hold awaiting Congress to debate an issue that was settled in 1990. Any further delay jeopardizes meeting these clean air targets for every area of the country.

III. RECORD OF ACCOMPLISHMENT IN ENERGY

As major fuel consumers, the trucking industry has traditionally been involved in all aspects of energy policy covered in the NES, both at the private level, conducting independent fleet research, and at the public level, working with DOE in a variety

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[5] American Petroleum Institute, 1991, Marketing Department.
[6] Facts and Figures '90. Motor Vehicle Manufacturers Association, Detroit, Michigan, 1990.
[7] Trucking Trends, 1990–91. American Trucking Associations, Inc. p. 18.

of programs, including fuel conservation, fuel economy, engine technology research, and alternative fuels demonstration projects.

Fuel Efficiency and Conservation

The trucking industry is integrally linked to the economics of fuel, and is constantly driven, without government intervention through regulation such as Corporate Average Fuel Economy (CAFE) standards or other mandates to improve fuel economy. In 1973, diesel fuel costs averaged under 25 cents per gallon, and were not a major operating expense. From 1972 to 1981, fuel prices rose by about 750 percent to approximately $1.00 per gallon, and about $1.50 today.[8] Now that fuel is a critical factor in operating expenses, lower consumption means lower expenses, which in turn translates to lower transportation costs, increased business and increased profitability.

In 1989, fleet fuel costs averaged between 5 and 15 percent of all operating expenses, depending on the type of business. Fuel costs trucking companies an average of 1.6 million dollars.[9] Motor carriers have a clear and absolute incentive to use fuel in a very efficient way, and have made substantial improvements in fuel efficiency and conservation.

The fuel consumption in 1973 for an average fleet pulling an average load of freight was approximately 3.0 to 3.5 mpg at best. During the 1980's, following the oil embargo, further improvements resulted in an increase to 4.5 to 5.5 mpg, leading to today's average 5.0 to 6.0 mpg; a 233 percent improvement from 1973.[10]

These improvements in fuel economy have resulted from a combination of supplier and motor carrier advancements in the design and operation of commercial vehicles. To move a truck from standstill, energy is required to overcome wind resistance and rolling resistance, which together account for 77 percent of total energy expenditures. To overcome these forces more efficiently, trucks and trailers have become streamlined and incorporated the use of aerodynamic devices to reduce wind resistance. Early retrofit devices available for trucks were not optimized for specific vehicles, but were still able to improve fuel economy by up to 10 percent.[11]

In the 1980's, original equipment manufacturers, began making available custom designed cab fairings and extenders which are able to add up to an additional 15 percent improvement. Since the mid 1980's, a systematic approach to improving vehicle aerodynamics has taken place, including reducing the frontal area of tractors, optimizing tractor body design to include sloped hoods, low profile front ends and other integral components to reduce wind resistance.[12]

To reduce rolling resistance, the shift to radial tires over the last 10–15 years has improved fleet fuel economy by 10–25 percent. In the late 1970's, the trucking industry was almost exclusively bias ply tires, which shifted to 10 to 20 percent penetration of radial tires on truck tractors in the 1980's. At present, well over 80 percent of truck tractors use radial tires, with approximately 30–40 percent penetration in mid-range vehicles (straight trucks), and about 60 percent on trailers.[13]

To account for other vehicle energy expenditures, industry suppliers and manufacturers together with motor carriers have introduced high torque rise low-RPM engines and drastically reduced the average truck engine size from 14 liters to approximately 10 liters, and improved fan clutches. With the increased the use of electronic engine controls, carriers will realize an additional 3–7 percent improvement in fuel economy.[14]

The improvements in fuel economy are obvious. For example, in 1973, one of the most common fleet tractors manufactured by a major domestic company achieved an average of 4.5 miles per gallon (mpg). That same model achieves an average of 7 mpg today, which accounts for a 55 percent improvement in fuel economy.

It is the joint efforts on the part of truck and engine manufacturers, motor carriers and government which have made the most advancements in fuel conservation. In 1975, the Voluntary Truck and Bus Fuel Economy Program was established by the Departments of Energy, Transportation, The Interstate Commerce Commission, and the EPA to increase the awareness of conservation opportunities and efforts that continues today to improve operating efficiencies in the real world.

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[8] Trucking Trends, 1990–91. American Trucking Associations, Inc., Alexandria, VA.
[9] Trucking Trends, 1990–91. American Trucking Associations, Inc.
[10] Society of Automotive Engineers, SAE P–488, 1975.
[11] Ibid.
[12] Ibid, p. 79.
[13] Ibid.
[14] Society of Automotive Engineers, SAE P–488, 1975.

From 1973 through 1979, the program was credited with saving well over 4 billion gallons of fuel from changes in operating practices and the purchase and use of fuel saving equipment such as radial tires and aerodynamic devices. Through 1985, it was projected that the benefits from this voluntary program actually surpassed fuel savings achieved under CAFE standards for light duty trucks during the same period.[15]

Efforts to improve fuel economy have not ceased. Recently, joint user and manufacturer initiatives have demonstrated what can be done with current production equipment. In a recent 19 day, 7,450 mile fuel economy run, three tractors with 1991 EPA certified engines pulling fully loaded trailers (65,300–79,400 lbs gvw) achieved an average of 7.68 to 8.21 mpg.[16]

A futuristic concept vehicle, employing fully optimized aerodynamics of both the truck tractor and trailer using a 1991 certified engine, averaged fuel economy of 10.49 mpg, fully loaded (71,200 pounds) during a 3,384 mile trip. During a single 704 mile segment, the vehicle achieved an average fuel economy of 11.54 mpg).[17] These efforts required an extraordinary effort and cooperation on the part of the fleet, vehicle, and engine manufacturers and is likely typical of the next generation in fuel efficiency capabilities. Most of all, this effort further demonstrated the unique relationship between industry manufacturers, suppliers and the motor carrier.

Productivity in Vehicles

Any discussion of fuel conservation and efficiency must include longer combination vehicles (LCVs). Longer combination vehicles, including double trailers and some triple trailer combinations now permitted in about 15 states, provide immediate benefits in both fuel economy and operational efficiency allowing fewer trucks to do more work. The savings from the use of LCVs is substantial, and could be as high as 320 million gallons per year.

In 1981, when 6 states and 18 territories (17 states and the District of Columbia), were studied to determine the benefits of conforming the size and weight of trucks to allow double trailers, it was determined that 93 million gallons of fuel could be saved per year; enough fuel to heat over 77,000 homes.[18] The further use of LCVs in suitable areas would offer even greater benefits.

Environmental Responsibility

Any national policy on energy consumption which fails to consider environmental impacts of the fuel use is without merit. The trucking industry has made substantial improvements in both areas over the last 18 years that have not been at the expense of the environment. On the contrary, heavy duty truck emissions have been significantly reduced over a short period of time. Additional reductions are planned for the next seven years because of EPA requirements as well as voluntary efforts to reduce emissions.

Heavy-Duty Engine Emissions Standards [1]

[Applies to all vehicles > 8,500 lbs gvwr *]

	Nitrogen Oxides	Particulates
1985	10.7	0.6
1991	6.0	0.25
1994	5.0	0.10
Cumulative percent reduction	53	83

(Units are Grams/brake-horsepower hour)

[1] Code of Federal Regulations, Volume 40, Parts 85–87.

Additional reductions are now planned as the result of the Clean Air Act Amendments of 1990. Beginning in 1998, clean-fuel heavy duty diesel engines must reduce combined levels of nitrogen oxides and non-methane hydrocarbons by as much as 50 percent from 1994 levels. Since these standards are intricately linked to the fleet

[15] Society of Automotive Engineers (SAE), SP–488.
[16] Commercial Carrier Journal, Radnor, PA, February 1991.
[17] Ibid.
[18] Potential for conserving fuel through modern truck size and weight regulations, 1981. American Trucking Associations, Inc. Washington, DC.

alternative fuels program, environmental benefits while using alternative fuels are guaranteed.

Fuel Diversification: Future for Alternative Fuels

The trucking industry has not waited for government mandates to investigate alternative fuels or to capitalize on the current glamour of the notion of non-petroleum fuels. Commercial trucking companies, engine manufacturers, and DOE have been investigating alternative fueled vehicles for many years prior to the NES.

Presently, there are 14 private sector projects underway in addition to the 14 government sector projects evaluating alternative fuel use in heavy-duty trucks. These studies are real-life demonstration projects of new engines and new fuels in commercial freight transportation revenue service, involving at least 10 manufacturers and suppliers. Typically, each project involves a single or perhaps two or three vehicles, because of the complexities and costs, and is designed to provide useful data to engine and vehicle manufacturers, fleet users and other interested parties.[19]

These partnerships between the manufacturers and consumers represent independent efforts to investigate and evaluate the feasibility of using alternative fuels in the real world. In order to conduct these investigations, trucking companies are investing hundreds of thousands of dollars in the hopes that they may be able to come up with a fuel and engine that best suits their needs, not one the government mandates that must be used. In the event that rigid mandates are imposed, the opportunity to fully investigate the safety, environmental impacts, and overall feasibility of using a specific alternative fuel will be extinguished. We are seriously concerned about the potential safety of using large quantities of alternative fuels on commercial trucks, and believe that it has not been even partially evaluated.

Diversification of Transportation Fuels

The trucking industry recognizes the importance of transportation fuels and therefore both the need to diversify those fuels and to use existing fuels more efficiently and responsibly. It is not as readily apparent which fuels are best suited for transportation sector.

While the need to diversify transportation fuels is important, the need to improve the efficiency and utilization of petroleum fuels is equally important. Under any scenario, we believe that it is unlikely that the infrastructure for alternative fuels could possibly be in place to support the mandate outlined in the proposal. Trucking companies can ill afford fast fill natural gas systems at a price tag of $750,000 per facility in each of 115 areas in three years as proposed in the NES. Ironically, the industry is currently in the middle of a ten year program to upgrade and replace existing underground fuel storage tanks. Companies can simply not afford to install additional fuel storage and dispensing to support the mix of transportation fuels required in the NES.

The Clean Air Act outlines a balanced and reasonable approach for providing adequate marketplaces for alternative fueled vehicles in reasonable time frames. Beginning in 1998, centrally fueled fleets of 10 or more vehicles must, when purchasing new or replacement vehicles, purchase 50 percent of those vehicles as clean fuel vehicles and use clean alternative fuels.

Under the Title II, Part C, of the Clean Air Act Amendments of 1990, clean alternative fuel is defined as

> (2) Clean Alternative Fuel.—The term "clean alternative fuel" means any fuel (including methanol, ethanol, or other alcohols (including any mixture thereof containing 85 percent or more by volume of such alcohol with gasoline or other fuels), reformulated gasoline, diesel, natural gas, liquefied petroleum gas, and hydrogen) or power source (including electricity) used in a clean-fuel vehicle. . . .

The emissions standards linked to clean fuel heavy-duty vehicles include a 50 percent reduction in a combined nitrogen oxide and non-methane hydrocarbon standard in 1998. The Clean Air Act assures environmental responsibility while allowing all fuels to be used based on their individual merits. These standards can not be met with simple add-ons or adjustments. They are tough standards which will require the combined talents of engine manufacturers, vehicle suppliers and fleets to make them work.

In addition, a strong incentive program is also included. Fleets desiring to purchase more than the required amount of clean fuel vehicles will receive marketable credits which can be traded and sold to other fleets within the non-attainment area.

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[19] ATA Engineering Department, Department of Energy, 1991.

Another strong incentive to use alternative fuels is contained in Title II of the CAAA. Fleets using clean alternative fuels will be exempt from transportation control measures such as time of day or day-of-week enacted by non-attainment areas to reduce vehicle congestion and air pollution. These credit provisions are a strong, tangible incentive for carriers to invest in a future with alternative fuels, and are driven by competition and market forces. The NES must categorically adopt the credit provisions in the CAAA.

Research

The trucking industry has worked tirelessly with DOE in the investigation into alternative fuels for over 18 years in search of better fuels and engines that will improve the efficiency of the industry. Unfortunately, in several instances these efforts have been seriously undermined by a lack of coordination of federal agencies.

The industry first began research into alternative engines and fuels beginning in 1972, when in cooperation with DOE's predecessor agency, the trucking industry conducted a 3 year evaluation of a gas turbine engine in a commercial over-the-road truck.

In the early 1980's, a major trucking fleet and petroleum refiner embarked on an investigation into the feasibility of a stratified charge engine in commercial trucks to provide improved economy and fuel diversity. That company attempted to field a 500 vehicle test fleet powered by the multi-fuel stratified charge engine. Even though the engine achieved a 38 percent improvement in fuel economy in the fleet's urban delivery operations, the program was ultimately killed because EPA demanded that the engine be certified for every fuel on which it could run. The millions of dollars invested, countless hours of research and knowledge gained were the unfortunate victim of an emissions policy, blind to the need to explore new energy technologies. If the Clean Air Act and the NES have different conflicting goals, the industry will find itself in a similar predicament; not in a research setting, but in the real world.

Most recently, the trucking industry was an aggressive supporter of the Alternative Motor Fuels Act of 1988 (AMFA); (P.L. 100-494). Sponsored by Senator Jay Rockefeller of West Virginia, this act specifically addresses heavy duty vehicles and directs DOE to investigate the feasibility of using alternative fuels in commercially viable truck operations. We believe that the results obtained from AMFA will begin to answer many of the questions regarding the practical use of methanol and natural gas in actual fleet operations. We have and will continue to work closely with DOE in this effort which is to actually get underway this year.

Impact of alternative fuels on the trucking industry

Because of the interest in alternative fuels and the lack of information evaluating these fuels in commercial trucking operations, the Trucking Research Institute commissioned a study to evaluate the impacts of certain alternative fuels on various aspects of the trucking industry. The study was jointly funded by motor carriers, engine and truck manufacturers, petroleum refiners and the natural gas and methanol industries.[20]

Completed last year, the study evaluated impacts on truck operations, facilities, equipment, personnel and health and safety given a scenario of mandatory alternative fuel use in 5 nonattainment regions of the United States. The fuels included in the evaluation were low-sulfur advanced diesel, methanol, compressed natural gas, liquified petroleum gas, and liquified natural gas.

The findings include:

Capital costs for alternatively fueled vehicles, including clean diesel vehicles, are expected to increase compared to existing diesel or gasoline trucks by between 3 and 23 percent.

Facility costs will be substantial for natural gas, which could be on the order of $750,000 per facility for a fast fill compressor system. A 24 percent increase to existing facilities would be incurred to upgrade fuel storage and delivery systems and maintenance areas to handle 100 percent methanol fuel.

Fuel costs will increase, 2 percent for clean diesel, 5 percent for compressed natural gas, to 84 percent for methanol (M-100).

This landmark study was the first of its kind to investigate the total impacts on the industry ranging from changes in facilities necessary to safely handle alternative fuels, to additional employee training and liability issues for carriers using these fuels in the future.

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[20] Impact of Alternative Fuels on the U.S. Trucking Industry, Battelle Memorial Corporation, 1990; for the Trucking Research Institute, Alexandria, VA.

IV. CONCLUSIONS

The trucking industry has a record of commitment and reflecting the importance of an adequate, safe and reasonably priced fuel supply. We believe that the Energy Strategy must not be a conflicting mandate for alternative fuels, but a framework for choices which will move the U.S. closer to energy independence by diversifying existing transportation fuels. We believe a comprehensive energy strategy should include each of the following as equal components:

Fuel conservation

New energy exploration,

Alternative fuels are equally important components of a comprehensive energy strategy.

The industry could then have the opportunity for choices as to what specific strategies it adopts to reduce energy consumption and/or to use alternative fuels.

The industry's record of accomplishment in overall energy policy dates back to the 1970's. The industry has conducted many private efforts into engine and fuels research and are committed to doing so in the future. We firmly believe that our history of good-faith efforts cannot and must not be discarded for the sake of guaranteeing a market for specific, unproven alternative fuels.

Therefore, we respectfully suggest the following amendments to the NES:

Categorically adopt the alternative fuels fleet program outlined in the Clean Air Act Amendments of 1990;

Include clean diesel fuel as an option for commercial truck fleets.

Not direct 10 percent of all imported oil into the strategic petroleum reserves.

Promote and assure the environmentally responsible exploration and recovery of existing domestic petroleum sources such as the Arctic National Wildlife Refuge.

Thank you for the opportunity to present the views of America's trucking industry regarding the future of the National Energy Strategy, and I would be happy to answer any of your questions.

The CHAIRMAN. Thank you very much, Ms. Batts.

Next we are happy to welcome our friend, Boone Pickens. Mr. Pickens.

STATEMENT OF T. BOONE PICKENS, JR., GENERAL PARTNER, MESA LIMITED PARTNERSHIP

Mr. PICKENS. Thank you, Chairman Johnston, and members of the Senate Committee on Energy and Natural Resources. Thank you for inviting me to testify this afternoon. For the record, my name is Boone Pickens, and I am general partner of Mesa Limited Partnership, one of America's largest independent oil and gas producers. And I am the newest board member of Natural Gas Vehicle Coalition.

I must confess that I am here with a conflict of interest here today, and I am trying—and my conflict is I am trying to sell more natural gas; at the same time save an industry. I want to commend the administration and Congress for aggressively pursuing a National Energy Strategy. Something must be done to reduce America's addiction to foreign oil.

Today we are paying a full price for foreign oil, selling our own premium domestic energy at a discounted price. And I am talking, of course, about natural gas. The goal of a National Energy Strategy must be to reduce the stranglehold placed on our economy and our environment by imported oil. We should begin with America's cars and trucks. Transportation accounts for nearly two-thirds of daily oil consumption in the U.S., and as you know, the National Energy Strategy submitted to Congress by the President calls for great use of alternative transportation fuels.

For economic and energy security reasons, the emphasis must be placed on domestic fuel alternatives. Five points correctly highlight the benefits of compressed natural gas over gasoline. First, the per-gallon equivalent cost of CNG is anywhere from 30 percent to 60 percent cheaper than gasoline. The Natural Gas Vehicle Coalition calculates that compressed natural gas retails for about 62 cents per equivalent gallon. Second, natural gas is the cleanest burning of all fossil fuels, producing significantly less pollution.

In the line of duty, engines, natural gas vehicles produce about 85 percent less reactive hydrocarbons in gasoline engines, in excess of 90 percent less carbon monoxide, and between 18 to 30 percent less of the greenhouse gases, carbon dioxide and methane. Third, because it is clean burning, vehicle maintenance costs are reduced. Some natural gas vehicle engines have logged 500,000 miles or more.

All of the Mesa, the company I am associated with, fleet vehicles operate on CNG. Our maintenance costs are reduced by 45 percent, and fuel costs reduced by 50 percent. Forced CNG is a safer fuel than gasoline. Natural gas is lighter than air and dissipates quickly, ignites at 1,300 degrees Fahrenheit. Gasoline ignites at 850 degrees.

Fifth and most importantly, the supply of natural gas is assured for the future. It is not short-term or environmentally trendy. If I could accomplish only one goal here today, it would be to destroy the myth that the U.S. does not have enough natural gas reserves to justify expansion into the transportation market. Virtually every study of U.S. natural gas reserves indicates at least a 30-year to 35-year supply at current production levels. And many studies extend that figure to a century or more when advanced exploration and drilling techniques are considered.

At Mesa alone, we have 2 trillion cubic feet of gas. And let me put that in perspective. In 1989, Mesa produced more than 130 billion cubic feet of gas, and that is enough to single-handedly meet the annual natural gas needs of Maine, New Hampshire, Vermont, Rhode Island, Delaware, and Washington, DC.

In the Natural Energy Strategy, Washington must move aggressively to remove the barriers that have stalled America's conversion to natural gas. The administration and Congress must prime the pump and create the market forces necessary to expedite this process.

Specifically, here is what can be done now. I would hope the President would issue an executive order placing the Federal Government on the leading edge of the natural gas movement in its own purchasing policy. Quit buying gasoline-powered vehicles altogether next year, and buy CNG vehicles. It should begin converting 500,000 Federal, commercial class cars and trucks immediately. Conversion costs would be offset by annual fuel savings of nearly $150 million. And if we can ship 500,000 Federal troops to the Persian Gulf in 3 months, surely we can convert a few hundred thousand vehicles and trucks to natural gas in 1 year.

Washington would demonstrate its commitment to natural gas, help develop the infrastructure necessary to create new jobs, and trigger consumer acceptance of compressed natural gas. Second, Congress should adopt the fleet conversion provisions of the admin-

istration's Natural Energy Strategy, and encourage the private sector to follow suit.

Finally, Congress should include in the energy legislation incentives for manufacturers and consumers to build and buy these alternative fuel vehicles. For manufacturers it could mean CAFE credits. For consumers, that would mean tax incentives.

In summary, natural gas, the clean-burning, plentiful, domestic energy source, can reduce our Nation's trade deficit and create new jobs. Unlike other alternative fuels, the technology is available today, not 5 years from now. And all Washington has to do is just prime the pump.

Thank you very much.

[The prepared statement of Mr. Pickens follows:]

PREPARED STATEMENT OF T. BOONE PICKENS, GENERAL PARTNER, MESA LIMITED PARTNERSHIP

Chairman Johnston, members of the Senate Committee on Energy and Natural Resources, thank you for inviting me to testify this afternoon.

For the record, my name is Boone Pickens, and I am general partner of Mesa Limited Partnership of Dallas, Texas. Mesa is one of the three largest independent oil and gas producers in the United States. Also, I am the newest member of the board of directors of the Natural Gas Vehicle Coalition, which is dedicated to expanding the use of natural gas vehicles (NGVs).

I want to begin by commending the Administration and Congress for aggressively pursuing a National Energy Strategy. I know that members of this Committee have spent countless hours over many years trying to develop a coherent federal energy policy.

Something must be done to reduce America's addiction to foreign oil. Until last August, we measured the cost of that dependence in pure economic terms. In 1989 alone, the U.S. paid nearly $33 billion to purchase OPEC oil. Approximately 50 percent of our domestic needs currently must be met with imported oil.

The price of our dependence on foreign sources of energy has acquired an entirely new meaning. With Iraq's invasion of Kuwait last August 6, we began to calculate the cost of our dependence in military terms, defense dollars and, yes, American lives.

Unfortunately, we're paying full price for foreign oil, and selling our own premium domestic energy reserves at discount prices. I'm talking, of course, of natural gas. The independent producer is responsible for finding 80 percent of the oil and gas in the lower 48 states. However, independents are not getting an adequate return on their investment under current market conditions. We need to maintain the independent producer's role if we are to decrease our reliance on foreign oil.

The goal of a National Energy Strategy must be to reduce the stranglehold placed on our economy and our environment by imported oil. We have to begin with America's cars and trucks, because the automobile is the dominant source of our insatiable demand for energy in this country. Transportation accounts for nearly two-thirds of daily oil consumption in the U.S.

As you know, the National Energy Strategy submitted to Congress by the President calls for a greater use of alternative transportation fuels. In fact, we need to focus on domestically-produced alternative fuels. I do not understand why the U.S. lags behind other countries in the production and use of alternative fueled vehicles. For example, according to the Natural Gas Vehicle Coalition, more than 700,000 vehicles on the road throughout the world today are powered by compressed natural gas. Unfortunately, only 30,000 of those vehicles operate on American roads.

In other words, the U.S., operates less than 5 percent of all NGVs. The U.S. share of NGVs in operation is embarrassing enough, but the number of NGVs as a percentage of total vehicles in operation in the U.S. is deplorable. Of the approximately 122 million vehicles estimated to be in use in the U.S., the 30,000 NGVs constitute only .02 percent—that is two one-hundredths of one percent.

The U.S. can and should do more, especially in light of the strides made in other countries with much smaller economies. Italy has 300,000 NGVs in operation and the Soviet Union has 250,000. In New Zealand, 20 percent of all the vehicles in operation, approximately 125,000 vehicles, are fueled by natural gas. By the way, most of the NGVs in New Zealand are passenger cars. These efforts in other countries

indicate to me that the technology is present, the price is right and consumer demand exists.

Did America demonstrate its military superiority in the Persian Gulf only to fall victim to its energy inferiority on its own streets and highways? I certainly hope not, but the jury is still out on this question. Unless we act now, when public opinion supports a federal energy initiative, we may not have the luxury of choosing our destiny in future years.

Once and for all, we need to reach a national consensus on an energy policy. A central focus of this policy should be the increased use of domestic natural gas to reduce our dependence of foreign oil to meet our transportation needs. Five points correctly highlight the benefits of compressed natural gas over gasoline.

First, natural gas is less expensive than gasoline. According to the Natural Gas Vehicle Coalition, the per-gallon equivalent cost of natural gas is 30 to 60 percent of the cost of gasoline. I should add that these estimates include the additional cost of compressing the natural gas. The current price per gallon equivalent of natural gas ranges from 40 to 75 cents. At Mesa we have reduced our fuel costs by 50 percent.

Second, natural gas is the cleanest burning of all fossil fuels, producing significantly less pollution. The Natural Gas Coalition has determined that natural gas produces only 1 percent of the carbon monoxide produced by gasoline. Natural gas produces almost no sulfur dioxide or particulates, and only 15 percent of the reactive hydrocarbons emitted from gasoline engines. NGVs emit 10-30 percent less greenhouse gasses than gasoline vehicles.

These numbers are powerful, but I suggest that you try your own experiment to dramatize the difference between gasoline-powered engines and natural gas-powered engines. Place a white handkerchief on the exhaust of a gasoline or diesel powered truck and do the same on an NGV. I am sure you will be surprised by the greater amount of residue generated by the gasoline or diesel engine. This test is certainly not intended to be scientific, but it paints a vivid picture of the environmental benefits of natural gas engines.

Third, because it's clean-burning, vehicle maintenance costs are reduced. In addition to the significant savings at the pump, NGV users also experienced lower maintenance costs. The engine, spark plugs and lubricants of an NGV wear much better than those of a traditional, gasoline-powered vehicle. In fact, NGV owners have reported that their engines may last 500,000 miles, and tune-ups may not be required more often than every 10-20,000 miles. At Mesa we are realizing maintenance cost reductions of 25 percent.

Fourth, natural gas is a safer fuel than gasoline. For several years the natural gas industry was the subject of a whisper campaign about the purported safety risks of NGVs. I hope that these groundless fears have finally been put to rest by one simple fact: there has never been a fire or an explosion involving a natural gas vehicle. Moreover, natural gas storage facilities have been tested repeatedly. Gunshots, dynamite, car crashes and other severe tests have been run on the cylinders used to hold compressed natural gas. Obviously, gasoline fuel tanks could not withstand such severe tests. I think that the results are at last being recognized. For example, the New York City Triborough Bridge and Tunnel Authority has changed its policy and now permits NGVs to travel in tunnels.

In most respects, natural gas is safer than gasoline. For instance, gasoline leaks can pool and create fire hazards or some other environmental risk. By contrast, a natural gas leak simply dissipates harmlessly into the atmosphere. Natural gas is neither corrosive nor toxic. The concerns about leaks at a gasoline storage facility are compounded because gasoline storage tanks are almost always underground. Leaks may go undetected for sometime. CNG storage facilities are above ground. Finally, gasoline is a more volatile fuel, igniting much easier than natural gas.

Fifth and most importantly, the supply of natural gas is assured for the future. It's not just a short-term solution. If I could accomplish only one goal here today, it would be to destroy the myth that the U.S. doesn't have enough natural gas reserves to justify expansion into the transportation market.

Let's review the facts. The Department of Energy has estimated that the U.S. has approximately 996 trillion cubic feet of natural gas reserves. At current rates of usage, this supply would last 40 to 55 years. This supply would jump four-fold if various "unconventional" sources of natural gas are included. These unconventional sources—such as coal seam methane, tight sands and shale gas—are not yet cost competitive, but are based on promising technology. Lastly, these estimates are based only on the reserves in the lower 48 states. The Alaskan reserves are substantial and so are the reserves in Canada and Mexico.

Critics of the expanded use of NGVs have argued that the increased use of natural gas for transportation will create shortages for residential and commercial users

during the peak winter months. While I certainly think that federal policy should assure an adequate supply of natural gas for existing purposes, I believe that increased pipeline capacity is the solution to this perceived threat. Moreover, the projected use of even 8 to 10 million NGVs would only account for an estimated 5 percent of all the annual consumption of natural gas. Frankly, we are many years away from increasing the number of NGVs in the U.S. from 30,000 to 10 million. During this time frame, I have every reason to believe that needed pipelines will be built if the demand is sufficient.

All of these national figures are somewhat overwhelming. Let me try to provide Mesa's perspective about the adequacy of current reserves of natural gas. At Mesa alone we have nearly 2 trillion cubic feet of gas. In 1989, Mesa produced more than 130 billion cubic feet of gas. That's enough to single-handedly meet the annual natural gas needs of Maine, New Hampshire, Vermont, Rhode Island, Delaware and Washington, D.C.

In the National Energy Strategy, Washington must move aggressively to remove the barriers that have stalled America's conversion to natural gas. The Administration and Congress must prime the pump and create the market forces necessary to expedite this process.

Specifically, here is what can be done now:

Number one, the Federal Government must lead by example.

As suggested in the President's National Energy Strategy (NES), the Federal Government should accelerate purchases of new alternative-fuel vehicles. The NES Report indicates that the Federal Government purchases 44,000 light-duty vehicles per year and operates a civilian fleet of 200,000 cars and light trucks.

The President can begin the acceleration process immediately by issuing an Executive Order mandating that all future Federal fleet purchases be natural gas vehicles, or other domestic alternative-fueled vehicles, provided they are available.

Moreover, the Executive Order should require that existing federal fleet vehicles be converted to natural gas whenever and wherever conversion is possible. In many instances the conversion costs may be recouped within two years.

I believe that the manufacturers will respond if the country's largest fleet purchaser (the Federal Government) starts immediately to put its money where its mouth's.

Regardless of the details, the President must provide leadership by initiating the Federal fleet strategy now. Under his leadership we sent 500,000 troops to the Persian Gulf in three months, I hope that with a similar commitment we can convert 200,000 to 300,000 cars to natural gas within a year.

Number two, commercial fleets in the private sector must be required to contribute to our national energy security and our environmental well-being.

The process for achieving this goal began last year with the inclusion of fleet vehicle provisions in the Clean Air Act Amendments.

Quite frankly, Congress needs to build on this foundation. The Administration's National Energy Strategy recognizes this premise and expands the requirements instituted in the Clean Air Act Amendments. I support this expansion and the members of this Committee should as well.

However, even more can and should to be done to increase the use of natural gas vehicles by private sector fleets.

The Chairman and Ranking Minority Member recognized this when they included in their bill (S. 341) provisions which:

(a) Remove regulatory burdens related to the use of natural gas as a vehicle fuel; and

(b) Encourage state and local public fleets by providing increased funding for joint ventures and cooperative agreements which would put more natural gas vehicles on the road over the next three years.

Number three, the Congress should accelerate private commercial fleet purchases by providing the necessary incentives to manufacturers, retailers and purchasers.

Adopting the Administration's NES proposal to remove the cap on CAFE credits for duel-fueled vehicles provides a serious but cost-effective incentive to manufacturers.

Providing tax incentives for investment in natural gas vehicle equipment, such as compressors, will dramatically enhance the distribution network for natural gas as a transportation fuel, while at the same time encouraging retailers and purchasers to enter the natural gas market on a wider basis. For example, I support the National Energy strategy Act of 1991 (H.R. 706) introduced by Congressman Andrews (D-TX), which provides a tax credit for investments in the alternative fuel area.

In summary, natural gas is a clean-burning, plentiful, domestic energy source that can reduce our nation's trade deficit and create new jobs. All Washington has

to do is prime the pump. I urge you to act now, while the general public understands the need for a comprehensive energy policy.

Thank you, I will be happy to answer any questions you may have.

The CHAIRMAN. Thank you very much, Mr. Pickens.

Mr. Krueger, welcome back, glad to have you. Please proceed.

STATEMENT OF ROBERT KRUEGER, CHAIRMAN, RAILROAD COMMISSION OF TEXAS

Mr. KRUEGER. Thank you very much, Mr. Chairman. Distinguished Members of the committee, I am delighted to be here and want to suggest that today what we are looking at is three goals that we would hope would be served by encouraging light vehicle fleets to convert to alternative fuels.

First, to lessen our import dependence; second; to improvement our health and environment; and third, of course, to develop technology and infrastructure so that we can expand this to the general public over time.

It seems to me that—and I will certainly address this question very directly—but it seems to me that this question of alternative fuel vehicles and CNG can only be addressed in terms of even the larger question of our larger energy posture. And since oil is the flexible fuel, oil can substitute for coal and oil can substitute in many cases for gas, which is not true vice versa.

In my judgment, there cannot be a sensible national energy strategy that does not also address the question of making oil available at stable and moderate prices. In my judgment, that in turn means that we should have a variable import fee, so that we have a floor price of about $20 for oil. Until we have a clear floor price for oil, in my judgment we cannot make rational judgments about alternative fuels because we do not know the costs of the fuel for which it is to substitute. And if we do not——

The CHAIRMAN. Senator Wallop and I have a bill that does precisely that. It is over at Finance at the present time.

Mr. KRUEGER. I will encourage the Senator from Texas to give it prompt attention.

The CHAIRMAN. Senator Wirth is a co-sponsor.

Mr. KRUEGER. Great. Well, I think that that is the fundamental thing that is necessary, and without addressing that we are essentially nibbling at the edges. That is the heart of the matter.

But I think there are very important things that can be done. In my judgment, natural gas is clearly the most desirable alternative fuel. Methanol simply is not as efficient, it is dependent on imports, it is not cost competitive, and it should not be the principal source by which we substitute.

Secondly, ethanol, as the chairman has already indicated—I was aware of a 60 cent-a-gallon subsidy; I did not realize that at $1.60——

The CHAIRMAN. No, it used to be $1.60 in my State, the State plus the Federal.

Mr. KRUEGER. I see.

The CHAIRMAN. The State repealed it because all the plants went broke and they figured it was not good.

Mr. KRUEGER. I think the senator is exactly right; we have to choose alternate fuels that are economically competitive. I voted,

when I was in the House, for electric vehicles and I do not see any around here now. And we spent a lot of money on research for it; it just has not been effective.

Propane, in my judgment, is at least partially dependent on imports, and probably is usable but is really not a substitute. Natural gas is the one thing that clearly can substitute, that meets our domestic energy needs by being, by lessening our import dependence, by being environmental desirable, and by being economically cost competitive.

Senator WALLOP. Bob, tell me why propane is necessarily——

Mr. KRUEGER. Why I do not give it as high a rating as natural gas? Well, it is not necessarily, but some of the natural gas stream, sometimes the natural gas stream domestically is used for propane; other times, it is my understanding that propane comes from the stream of imported oil. And if that is correct, then we do not do as much for lessening our import dependence.

Senator WIRTH. But we would not have to use some imported——

Mr. KRUEGER. If we are willing to use enough natural gas, that is true. I would concur. Natural gas is available, as Boone Pickens has just said, it is available. And whereas 15 years ago we were told we were about to run out, and people were saying by the year 2000, we will either have Armageddon, or, you know, the Aquarian Age, or who knows what.

But I am convinced that we will continue to have natural gas supplies for a long time. All of the recent evidence is that we have increasingly been able to discover additional capacity to remove natural gas, to make it available, and that it will be available for a 50-year period. That is the combined judgment, and I have it in my written testimony, it is the combined judgment of groups like the Gas Research Institute, ENRON, the Department of Energy and many others.

Given that availability, given that it is domestic, what is our experience? Well, let me point to my home State of Texas, where we are undertaking now some new efforts with regard to CNG. Effective September 1991, all purchases of school buses in the State of Texas by any school district that has 50 or more buses will have to be alternate fuel capable. The same is true for any State agency that has 15 or more cars. The requirement is made of all metropolitan transit systems.

And if we look at Garland independent school district, which since 1982 has used natural gas, Garland ISD says that for a cost of $241,000 in 1982 they were able to convert 60 school buses, to get slow feed facilities for CNG, and two fast-feed facilities, for a total cost of $241,000.

The CHAIRMAN. You are talking about alternative fuels; you are talking natural gas.

Mr. KRUEGER. I am talking CNG, I am talking CNG-powered school buses. They have 60 school buses that they bought back in 1982; they indicate that they now save $136,000 a year on the CNG-powered school buses. Because instead of buying gasoline for 92 cents per gallon, they are buying a gasoline equivalent of 32 cents per gallon in Garland, to which they add 5 cents for servicing costs. So they estimate their costs to be 37 cents versus 92 cents.

The CHAIRMAN. Do you know what the conversion costs on a school bus?

Mr. KRUEGER. The conversion cost initially, in 1982, to convert 60 school buses, plus providing one slow-feed facility and two fast-feed facilities, at that time was $241,000, to do all of that.

The CHAIRMAN. Do you figure you can recover that cost?

Mr. KRUEGER. They recovered it in 3 years. And there is a major gas company in Texas that is now sending out letters saying, "We will take all of the up-front costs of your conversion, if you will give us a 3-year contract to provide natural gas, we will provide it at a fuel equivalent cost less than gasoline."

So they do not have to face any capital costs themselves. This is being done in order to try to help meet the State-mandated standards.

Back when I was in the House, I voted for those CAFE standards if that is what they were called, that required 20 miles per gallon 1980. In my judgment, that was a responsible vote. Not all that I cast were; I think that one was. I think it was responsible because it helped push the industry in that case toward economically competitive with Japan.

In my judgment today, Government needs to take the lead because of the chicken-egg problem that has already been suggested. Somehow we have to establish the market. I think the responsible thing to do would certainly be to require Federal vehicles, wherever it makes sense, to have centrally refueled vehicles, to convert to CNG and to encourage other fleets to do the same thing. And if we do that, I think we will meet those goals of lessening import dependence, on improving our health, of getting something that is commercially competitive.

I think clearly the committee is doing the right thing in undertaking hearings on this, and I would certainly hope that the energy industry would work with Detroit and Government to make CNG-powered vehicles more widely available.

[The prepared statement of Mr. Krueger follows:]

PREPARED STATEMENT OF ROBERT KRUEGER, CHAIRMAN, RAILROAD COMMISSION OF TEXAS

Mr. Chairman, members of the Committee, my name is Robert Krueger, and I serve as Chairman of the Texas Railroad Commission, which, in spite of its name, has since the 1920's regulated the oil and gas industry of Texas. I wish to thank you for your invitation to testify on the alternative fuel fleet proposals in the National Energy Strategy Act (Title VII, S. 570).

Three major goals can be served by encouraging light-vehicle fleets to convert to alternate fuels:

1. We can lessen our import dependence and thereby improve our military, political, social, and economic security and well-being.
2. We can improve our health and physical environment.
3. We can foster the development of technology and infrastructure necessary for the later expansion to the general public of commercially competitive alternative-fuel vehicles.

In my judgment, all these goals can be achieved with proper governmental action now, and I commend your committee for addressing this need.

Your letter inviting me to testily here, Mr. Chairman, asks "Whether sufficient supplies of alternative fuels . . . will be available on a schedule to meet the requirements" of the National Energy Strategy Act. The answer, however, depends upon how alternative fuels fit into our larger energy framework.

None of the goals mentioned above can be achieved until this nation has a rational policy regarding oil. And unfortunately, the National Energy Strategy ignores this fundamental need.

Oil is the umbilical cord that feeds the world's industrialized nations. It is our most flexible fuel, and can usually be substituted for either coal, natural gas, or nuclear power, whereas they can only occasionally substitute for oil. It therefore determines the economics of alternative fuels that might substitute for oil, and, ultimately, sets their price.

There simply can be no national energy strategy without adequate supplies of oil available at stable, moderate prices. And we can only assure such availability if a significant part of those supplies comes from American soil rather than the sands of the Sahara. To gain such supplies, we must have a floor price for domestic oil of about $20.00 per barrel. That floor price could most easily be achieved through a variable oil import fee that would take effect at any time that the world price for oil dropped below $20.00. By taxing foreign oil to that value the domestic price, of course, rises accordingly.

With an established, stable, moderate price for oil, other alternative fuels then become practicable, and we have a standard by which to judge what constitutes a reasonable price for alternative fuels that might substitute for gasoline.

Without question, in my mind, the must desirable alternative fuel—for the three reasons given above—is natural gas.

Each of the other alternative fuels offers problems:

1. Methanol is imported, and only about 60% as fuel efficient as gasoline. It therefore fails two of three tests: It does not lessen imports and it is not sufficiently economically competitive to be accepted by consumers.

2. Ethanol is even more costly and less fuel efficient than methanol. Only government subsidies of about 60 cents per gallon have kept it in our fuel mix for this long.

3. Electric vehicles have not been accepted by the public because of their low power, heavy batteries, and short range.

4. Propane depends on imported feedstock, and is more dangerous as a vehicular fuel than several other fuels.

Only natural gas can lessen import dependence, improve our environment and health, and compete economically with gasoline.

Supplies of domestic natural gas are available to meet the increased demand that would result over the next decade by converting light-vehicle fleets to compressed natural gas (CNG). A decade or more ago the prevailing wisdom was that we were about to run out of natural gas. That simply proved untrue. Two things happened: (1) Our capacity to find new fields of natural gas, because of technical advancements, improved considerably. (2) Because of improved technology, we developed greater capacity than previously existed to remove natural gas and oil from known fields. As a result, with moderate prices, we can count on enough natural gas to supply us for more than fifty years at levels of usage slightly higher than at present.

One can find various estimates of America's natural gas reserves; some are included in an appendix to this testimony. Let me simply say here that, for the lower 48 U.S. states, the average of recent estimates of natural gas reserves available at $3.00 per mcf, with advancing technology, made by the National Research Council, Department of Energy, Department of Interior, Gas Research Institute, Enron, and Potential Gas Committee, comes to 876 trillion cubic feet; that is, about a fifty-year supply, at present levels of consumption.

While domestic supplies of natural gas are not nearly so large as are those of coal, they are adequate both for increased use in the near term, and for our long-term domestic requirements. In the 1970's, our annual use of natural gas reached 22 tcf; today, our usage is slightly less than 18 tcf. We have the capacity, in my judgment, again to produce 22 tcf, given an adequate price for natural gas. That price, however, depends partly on the price of oil. Further, the shift in gas markets away from the industrial midwest to the two coastlines requires the construction of some new pipeline facilities. But this need, I believe, your committee is already addressing. Such pipelines can certainly be built in a short time.

What will most benefit the production of this most pristine, domestically produced fuel, is a stable, moderate price and growing markets. Significant conversion of light and medium-duty fleets to CNG-powered vehicles is technically possible, environmentally desirable, and economically practicable.

In June, 1989, the Texas Legislature, at the prompting of Land Commissioner Garry Mauro, passed clean air legislation requiring Texans to use clean fuels like natural gas for transportation and industrial boilers. After September, 1991, school

districts with more thin 50 buses, state agencies with more than 15 vehicles, and metropolitan transit authorities may not purchase any vehicle incapable of using CNG or an alternate fuel that reduces harmful emissions. By September, 1994, 30 percent of these total fleets must operate on alternate fuels; by 1996, 50 percent; and by 1998, 90 percent. Only if the affected entities lack access to a central refueling station for alternative fuels, or if they can demonstrate that they cannot reasonably expect to save money by conversion, can these requirements be deferred.

Such deferral is unlikely, however, because those entities covered by this legislation may acquire the necessary equipment for refueling facilities for alternative fuel either by purchase, lease, gift, loan, or service contract. One major supplier of natural gas has already written to school districts, state agencies, and metropolitan authorities to indicate that it will assume all costs of vehicle conversion and the installation of fueling facilities in exchange for a three-year contract to provide CNG a cost lower than that of gasoline.

The company is confident in making this offer because it has for eight years been profitably providing natural gas to a school district for its CNG-powered school buses at costs well below those of gasoline.

In 1982, Garland Independent School District (near Dallas) spent $241,000 to convert part of its school bus fleet to CNG. This sum covered conversion costs for 60 school buses, installation facilities to fuel them simultaneously on a "slow feed", and installation facilities for two "quick feed" fueling stops. Their total installation and conversion costs were recovered within three years through savings on fuel. In June, 1990, they paid 92 cents per gallon fur gasoline; they bought CNG for 32 cents per gallon of gasoline equivalent. Even by adding a 5-cent maintenance cost for maintaining CNG facilities, they estimate annual savings of $136,000 per year. Additionally, they halved their costs on oil, filter, and spark plug changes. They have essentially no repairs to exhaust systems, because natural gas burns so cleanly.

Using CNG for fleet vehicles creates certain inconveniences, which should be acknowledged:

1. The fleets must normally be centrally refueled because a broad infrastructure of CNG service stations is not yet available.
2. CNG-powered vehicles require approximately 4 to 4.5 times the storage space for fuel in order to go the some distance allowed by gasoline.
3. The technology for conversion is still so new that the quality of conversions varies considerably.

On the other hand, some inconveniences are not as great as one might suppose:

1. Garland ISD, with eight years of experience of using CNG-powered school buses, reports savings in labor costs because their 60 buses can be refueled overnight simply by hooking up a line and letting the buses "slow fill" by themselves. The mechanism automatically shuts off when the tank is full.
2. "Fast fill" stations allow vehicles to be refueled as quickly with CNG as with gasoline.
3. Power and efficiency of CNG-powered vehicles are almost identical to gasoline-powered vehicles.
4. Switching or conversion from gasoline to CNG is possible simply by the flick of a switch on the dashboard.
5. Refueling stations are increasingly available. In Washington D.C., Denver, Colorado, San Diego, California, or Austin, Texas, one can stop at a service station and fill up with CNG.
6. The vehicle range is being extended. General Motors is now manufacturing CNG-powered 3/4 ton pick-up trucks and advertises a range of 200 miles. The weight of the vehicle is only 150 pounds greater than that of a comparable gasoline-powered truck.

On balance, then, the requirement for gradual fleet conversion to CNG-powered vehicles contained in your bill is reasonable. Doubtless unanticipated difficulties will arise as conversion begins. But without government mandates for some change, developing the necessary infrastructure for installing and servicing CNC-powered equipment would be further delayed. And delay means growing pollution and growing import dependence.

Government, in this case, can supply the necessary market to warrant an investment in the necessary infrastructure. Indeed, the Clean Air Act makes inevitable some changes in the fuels we use. The question is simply: which change make most sense?

In 1975, when I served as a member of the Energy and Power Subcommittee in the House of Representatives, I supported a provision requiring American automakers to manufacture cars with fleet averages of 20 miles per gallon by 1980. Auto manufacturers opposed such requirements, stating that they could not possibly meet

them. Not only did they meet them, but, had they not been required to do so by the Congress, the American auto industry might have responded even more slowly than it did to the Japanese challenge of producing lighter, more fuel-efficient cars.

Similarly, in requiring fleet conversions to alternate fuels, we have an instance in which government simply must take the lead. Private industry will not be concerned with reducing our dependence on foreign imports and improving our environment when there is no immediate economic benefit to its shareholders for doing so. Only the government can set these important social, economic, and environmental goals. But the government should do so in a way that does not damage our economy and our major industries. Its actions must be both economically and environmentally defensible.

Twenty years ago the government had to take the lead in requiring lead to be removed from gasoline. Today, lead pollution is less than 1 percent of the 1970 level.

Any corporation legitimately feels obliged to look after the economic interests of its shareholders. Those interests seldom include environmental, military, or strategic concerns. Therefore, auto manufacturers and oil companies will not, on their own, undertake to lessen our dependence on imported on, or to clean up our air. Their shareholders do not expect it of them.

Citizens, on the other hand, legitimately expect healthful air, and military and economic security from the actions of their government. In my experience, markets respond well to immediate needs. Government, however, can respond better to the long-term goals of society. I believe it is entirely legitimate, and indeed desirable, to have the government mandate that its own fleets, and increasingly, the fleets of private business, convert from gasoline to compressed natural gas. If Washington will take this lead, then Detroit and the energy companies will provide the equipment to make available CNG-powered vehicles that can drive our streets with minimal inconvenience and with minimal pollution.

The technology for CNG-powered vehicles is well-proven. America now has only 30,000 of the approximately 600,000 CNG-powered vehicles in use worldwide. But drivers from New Zealand, to Italy, to France, have proven the technology for decades.

The United States has proven its appetite to be so great that we now send over a billion dollars a week to pay for current consumption of foreign oil. If we are to avoid being a nation of sharecroppers, in which we, increasingly, work for foreign employers who own our assets, and who have amassed the capital that we have flagrantly wasted, then we must turn increasingly to our energy sources.

It is fortunate for America that a readily available domestic energy source—natural gas—is both environmentally and economically our best substitute for foreign oil. Let's use it.

Thank you.

[Appendix]

TWO ADDITIONAL OBSERVATIONS

1. Domestic Natural Gas

The following report on the U.S. natural gas resource base is taken from *Policies to Assure America's Energy Future*, a report by the Office of the Governor of Texas, January 1991:

> Recent estimates of gas resources accessible at different prices and different assumed levels of technology confirm the consensus that U.S. resources of natural gas are large.
>
> The first of several recent estimates was made by the U.S. Department of Energy in 1988, assuming existing technology and prices of $3 and $5 per mcf. These estimates were adopted by the Governor's Energy Council (Texas) and the American Association of Petroleum Geologists, but both these groups also estimated accessible remaining volumes at these price levels but with assumptions of advanced technology. Other recent estimates have been published by the Gas Research Institute, Enron Corporation, the Potential Gas Committee, the National Research Council, the Department of the Interior, and again, the Department of Energy.
>
> The average of lower 48 estimates made by DOE, GRI, Enron, PGC, NRC, and DOI is 945 tcf. These estimates all assume resources recoverable with existing technology, independent of price. The lowest estimate is that of the U.S. Department of the Interior. Although this estimate is widely quoted, it should be pointed out that all unconventional gas resources (tight formation, coalbed methane, shale, and so forth) were excluded and that the methodology used by

the DOI to calculate future reserve growth yields a figure not half the average of the other five estimates of reserve growth. In the area in which Interior analysts concentrate—conventional, new-field, discovery resources—their mean estimate is near the average of all other published estimates.

The highest resource estimate is that reported by the National Research Council based on analyses by ICF Resources. This estimate, added to cumulative production, exceeds 2000 tcf.

Estimates of the volume of U.S. lower 48 resources judged accessible at $3/mcf with existing technology range from a low of 452 tcf by Enron (their $3/mcf assumes flat costs) to 604 tcf by NRC/ICF. The Interior estimates are of "economically recoverable resources," but approximate a level below $3/mcf. The average if all estimates is about 540 tcf, equivalent to a 30- to 35-year supply at current production levels.

The average estimates of lower 48 resource volumes, assuming a price of $3/mcf and advanced technology, is 876 tcf, 60 percent greater than estimates at the same price level but with existing technology.

What has clearly emerged over the past three years is a rather remarkable consensus among governmental, private, and academic analysts that the remaining U.S. gas resource base is not only ample, but that a substantial part can be accessed at moderate costs and even more with application of advanced technology.

2. Oil Price Volatility

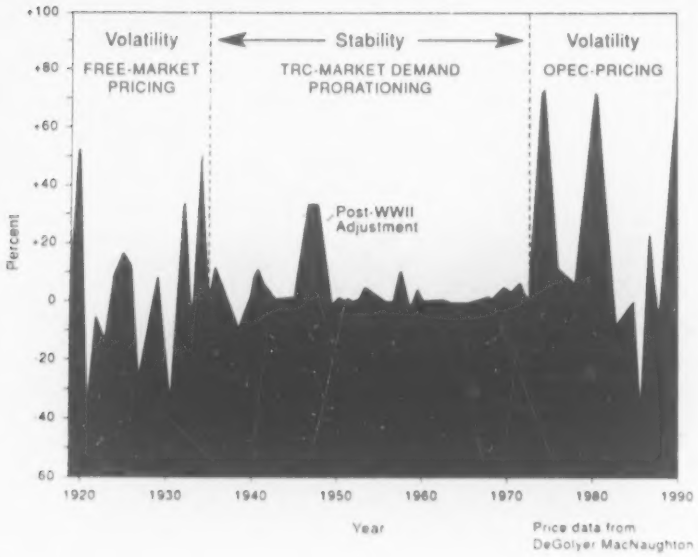
Neither producers nor consumers want to return to the volatile pricing of the 1980's. What is required is not excessively high prices but stable, moderate prices. A graph prepared by DeGolyer MacNaughton shows the difference in oil price volatility during three different periods: 1918-34; 1934-73; 1973-90. The first period of Free-Market Pricing, and the third of OPLC-pricing both show precipitous volatility. The intervening period of Price Stability occurred when the Texas Railroad Commission effectively set prices through market demand prorationing.

Such stability could be achieved only when Texas was the marginal, or swing producer, and a dominant force in the marketplace. Clearly, both Texas and the USA have lost that position.

The American consumer, however, was much better served during those intervening forty years in which the Commission set the price than in the periods that preceded and followed it.

Price stability is not possible today through the Texas Railroad Commission. But is possible through the actions of the U.S. Congress. Worldwide, oil prices (which set other energy prices) are set by governments, not by a free market. They are therefore instruments of strategic foreign and economic policy. If the United States is to avoid being a pawn in this game, we must set a floor price for oil.

The price might be set either by congressional fiat or by an import fee that became effective whenever the price of imported oil fell below $20. With a predictable floor price established for oil, investments could be rationally made In alternative-fuel technologies. One of the reasons that some of the efforts to develop alternative energy sources failed in the 1980's as because of the volatility of oil prices.


Volatility
FREE-MARKET PRICING
Stability
TRC-MARKET DEMAND PRORATIONING
Volatility
OPEC-PRICING
Post-WWII Adjustment
Percent
+100
+80
+60
+40
+20
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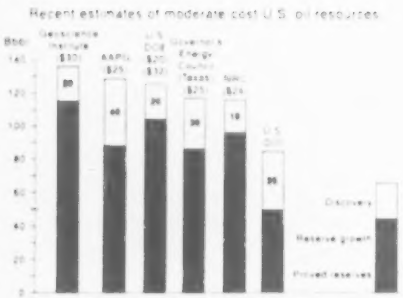
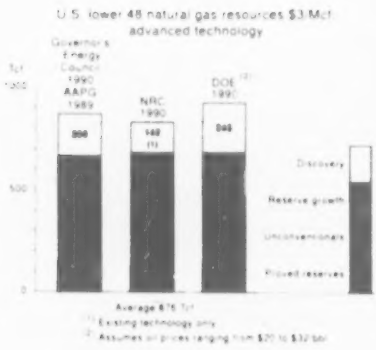
40
60
1920
1930
1940
1950
1960
1970
1980
1990
Year
Price data from DeGolyer MacNaughton


Recent estimates of moderate cost U.S. oil resources
Bbo
Discovery
Reserve growth
Proved reserves


U.S. lower 48 natural gas resources $3/Mcf advanced technology
Tcf
AAPG 1989
NRC 1990
DOE 1990
Discovery
Reserve growth
Proved reserves
Average $/6 Tcf

The CHAIRMAN. Thank you very much, Mr. Krueger.
Mr. Vaughan.

STATEMENT OF ERIC VAUGHAN, PRESIDENT AND CHIEF EXECUTIVE OFFICER, RENEWABLE FUELS ASSOCIATION

Mr. VAUGHAN. Thank you, Mr. Chairman. My name is Eric Vaughan. I am the president and chief executive officer of the Renewable Fuels Association. That is the national trade association for the domestic ethanol industry. About 2 hours ago I was really pleased to have an opportunity to be here today. I think I will wait and hold judgment on the pleasure of being here today until the end of the questions.

[Laughter.]

Mr. VAUGHAN. It is indeed, though, an opportunity, and I do appreciate having the opportunity to be with such a distinguished panel.

I share the chairman's view on the President's position, or at least the stated goal of these alternative fueled vehicles and the unfortunate situation that may develop where a single alternative fuel will be selected. However, I felt the need to rush out and call many of our members to explain to them that we are all wrong, and Chairman Johnston has determined that it is going to be an ethanol fuel program.

We are convinced that it is a methanol fuel program, and we would share your comments earlier about methanol, and certainly would align ourselves to Mr. Krueger's comments. Methanol is quite a toxic fuel, it is very low in Btu content. Virtually all of it is imported. But that is the fuel of choice where this program would go; it is clearly where it is going in California, where several thousand vehicles are running on pure methanol. And the fueling stations that is dedicated to this point are all methanol.

The interesting thing about the National Energy Strategy from our standpoint is not so much what is in it, but what is not in it. We do not believe there is anywhere near enough emphasis on natural gas vehicles as the clean-burning fuel alternative that ought to be used as a domestic fuel alternative.

Why we would ever enter or engage in a program of importing tremendous volumes of methanol into this country and determine that to help in any way enhance our national energy security is really beyond our, even our wildest imagination.

But what the administration left on the cutting room floor somewhere in the Department of Energy, or the Office of Management and Budget, maybe more likely, is the blends component, where ethanol today is sold and marketed in 45 states all across the country. A great deal has happened since the early days of the industry, which is about 1.2 billion gallon industry capacity today.

Every single day in the United States, 15 million cars are running and operating on 10 percent ethanol blends. These blends add oxygen to the fuel, which as the Clean Air Bill greatly demonstrated over the course of the several-year debate, has demonstrated to reduce levels of pollution, carbon monoxide, can very effectively address ozone pollution levels, is thought to be one of the very best

fuel alternatives for dealing directly with toxic levels and the aromatics in gasoline.

More importantly, from the standpoint of the economics of the marketer blender, ethanol can add octane and is a very effective octane booster, which boosts performance in those vehicles. The tax credit has been discussed quite vigorously here during the course of the hearing. Tax credits made available only to the oil companies who choose to blend the product, and some 3,000 marketer blenders from all across the country use ethanol on a daily basis. It is offered in some 750 terminals located, again, all across the country.

Some of the most exciting new growth has nothing to do with clean air, but has everything to do with the role that alternative fuels can play in our national energy picture. Getty Petroleum, for example, in the Northeast, specifically New York, has just opened its 400th station—excuse me, its 500th station offering a variety of ethanol blended products.

We believe ethanol has a flexible and a very efficient role to play in the national energy security plan as a blends component, as a feed stock for ethers, and something called ethyl tertiary butyl ether, which may play a role in reformulated gasoline. And possibly has a role in fuel injection systems for buses. Linda Stuntz mentioned many of the UMTA grants that are going out. There are some 740 buses across the midwestern part of the United States using a fuel injection system of ethanol that never requires more than several hundred dollars worth of a conversion, and never interacts directly with a diesel fuel.

Again, we believe that ethanol has a role; we think it is a flexible role and we think it is a serious role in our Nation's energy security picture. I would like to have the opportunity to m[illegible]et with your staff to discuss what you heard earlier today about [illegible]e plan and the role of ethanol versus methanol in these neat, alternative fuel vehicles. That is not the role we see for ethanol in the United States.

While in my testimony, you would read that in Brazil, a tremendous amount of work has been done on neat fueled vehicles. And there are some 8.5 million cars in the country running on pure ethanol. Interestingly enough, none of them optimized to run on ethanol, which is a major flaw of the administration's initiative. To provide a flexible fuel vehicle standard, ethanol, methanol, gas, any of the three gasoline—excuse me—would provide for a fuel-inefficient vehicle, and a strategy that does not set ourselves on a course toward any type of energy security.

We ought to be focusing ourselves, as many of the previous witnesses have suggested, on vehicles dedicated toward natural gas, toward liquefied petroleum gas, and others. We believe there is a tremendous, very positive future in that area, just as we think there is a very positive future and a greatly expanded future for the blended product all across the country. And I would look forward to your questions, and again, I want to thank you very much for the opportunity to be here today.

[The prepared statement of Mr. Vaughan follows:]

Prepared Statement of Eric Vaughn, President and CEO, Renewable Fuels Association

INTRODUCTION

On behalf of the Renewable Fuels Association, the national trade association for the domestic ethanol industry, I want to thank the Senate Committee on Energy and Natural Resources for the opportunity to present testimony regarding the President's National Energy Strategy. My testimony will focus on the alternative fuels provisions included in the National Energy Strategy and the flexibility of ethanol as a gasoline blend component; feedstock for high octane ethers; and as a neat, or replacement fuel capable of meeting the increased demand for alternative fuels anticipated by the National Energy Strategy.

BACKGROUND:

Since last summer, when U.S. oil imports exceeded total domestic production for the first time in history, there has been an increasing awareness of the dangers to our economy and security resulting from such a dramatic dependence on foreign oil. Public awareness became public alarm when Iraq invaded Kuwait. Suddenly, the very real price we as Americans pay, both literally and figuratively, for our growing dependence on imported energy became terrifyingly clear.

One consequence of these events is the widespread, bipartisan, grassroots support for a fundamental change in our energy policy. In fact, one recent poll concluded that nine out a of every ten Americans believe the U.S. needs to reduce our reliance on oil and increase the use of domestically produced, renewable fuels, such as ethanol.

We must look at our energy policy, its effects on the current transportation fuel market, and its impact on economic, trade and foreign policies. What is abundantly clear, is that oil cannot continue to monopolize the U.S. energy marketplace, that alternatives to oil must be more fully utilized if America is to regain the economic strength that has made us a great nation, and that ethanol, because it is a domestically-produced, environmentally sound fuel that can provide immediate benefits, should be an integral part of America's energy future.

Historically, our energy policy has been an oil policy. The government looked to Big Oil's interests to insure our national energy security. The underlying assumptions were that the interests of the government and the oil companies ran parallel and that the oil companies were reliable instruments to achieve and maintain energy security.

By the mid 1960's, with U.S. reserves dwindling (now less than 26 billion barrels), and the cost of production rising, U.S. gasoline marketers began to look elsewhere for their oil supplies. Today, the U.S. imports more than twice as much oil as anyone in the world, more than 2.4 billion barrels annually (see table 1). Every single day Americans pay more than $160 million for imported oil. Last year alone our country paid a staggering $58 billion for oil imports.

Obviously, where there are importers, there are exporters. And these countries have benefited from the largest transfer of wealth in history. In ten years the U.S. spent $1.1 trillion on oil imports—an oil bill paid with money borrowed from Japan. Table 2 is a list of the major benefactors of Big Oil's import binge made possible by a failed energy policy.

The most troubling aspect of table 2 is that it makes clear that our dependence on oil will only continue to concentrate both wealth and power with a small number of oil rich countries. Five countries control more than two-thirds of the world's proven oil reserves: Iran, Iraq, Kuwait, United Arab Emirates and Saudi Arabia. For perspective, consider that the proven oil reserves of Kuwait alone are almost double the combined proven reserves of the United States and Western Europe. If our dependence on oil continues, so too will the geopolitical and economic strength of those five countries.

As a result, the need to encourage conservation and develop alternative energy sources such as ethanol is greater than at any time in our history. Our economic, energy and environmental security depend on our commitment to reducing our dependence on imported oil, finding domestically-produced clean-burning alternatives, and establishing an energy policy which reflects U.S. public policy objectives.

This sentiment was noted by Secretary of Energy James Watkins in announcing the findings of the Department's exhaustive public comment on energy policy and proposing the Administration's National Energy Strategy:

> Public comment received during development of the National Energy Strategy revealed virtually *unanimous* support for the development and use

Table 1. TOP TEN OIL IMPORTERS [1]

Country	Annual imports [2]	Percent of consumption	Main suppliers
United States	2,421	48	Saudi 18; Nigeria 12%; Mexico 12%; Canada 11%; Iraq 7%.
Japan	1,191	99	UAE 20%; Saudi 16%; Iraq 6%.
Germany	674	98	USSR 30%; UK 26%; Lybia 16%.
France	483	96	Saudi 18%; USSR 14%; Norway 8%.
Italy	461	93	Lybia 25%; USSR 19%; Iraq 13%.
Netherlands	352	94	Iran 22%; UK 14%; Kuwait 13%.
Spain	338	99	Mexico 23%; Nig. 15%; USSR 13%.
S. Korea	261	100	Saudi 14%; UAE 9%; Kuwait 4%.
Singapore	252	100	Saudi 28%; UAE 9%; Iran 10%.
Brazil	233	53	Iraq 38%; Saudi 22%; Iran 9%.

[1] Prior to Iraq's invasion of Kuwait.
[2] Million barrels.

Table 2. TEN LARGEST OIL EXPORTERS [1]

Country	Annual exports [2]	Reserves [2]	Main markets
Saudi Arabia	1,363	255,000	U.S. 52%; Japan 14%; France 6%.
USSR	1,026	58,500	Germany 13%; Czech 12%; Pol 10%.
Iraq	823	100,000	U.S. 16%; Brazil 11%; Turkey 11%.
Iran	564	92,900	Neth. 14%; Japan 12%; Italy 9%.
United Kingdom	513	5,200	Ger. 27%; Canada 18%; U.S. 18%.
U.A.E.	500	98,100	Japan 47%; Italy 7%; U.S. 5%.
Mexico	497	54,100	U.S. 52%; Spain 16%; Japan 13%.
Nigeria	454	16,000	U.S. 49%; Spain 11%; Ger. 8%.
Venezuela	382	58,100	U.S. 44%; Antilles 15%; Ger. 9%.
Norway	343	10,400	U.K. 34%; Sweden 12%; Ger. 12%.

[1] Prior to Iraq's invasion of Kuwait.
[2] Both Exports and Reserves are listed in million barrels.
N.B. U.S. reserves are less than 26,825 million barrels.

of renewable energy sources because of their environmental and energy security advantages." (emphasis added)

This reflects a recent nationwide public opinion survey conducted by Howard J. Rubenstein & Associates on behalf of the Renewable Fuels Association to assess the nation's pulse regarding energy security. Of particular note was the fact that a majority of those polled said they would utilize alternative fuels even if available only on a voluntary basis.

Specifically, the study found:

83% believe the U.S. government should actively promote the development of alternative energy sources as a replacement for imported oil;

85% are in favor of seeing a percentage of the current U.S. gasoline supply being replaced by alternative energy sources, particularly blended renewable fuels such as ethanol;

50% said that alternative fuels should comprise more than 15% of our gasoline supply. 38% said that at least 25% of our current gasoline supplies should be replaced by alternatives; and

84% of those responding indicated that they would be willing to use alternative fuels even if they were offered only as part of a voluntary National Energy Policy.

It is clear from these results that Americans across the country feel strongly that alternative fuels, such as ethanol, should be an integral part of any comprehensive national energy security plan.

ETHANOL'S ROLE IN THE MOTOR FUELS MARKET

Over the past ten years, the U.S. ethanol industry has developed as a blend component in gasoline. Fuel marketers used ethanol first as a gasoline extender, then as an octane enhancer, and now as an oxygenate. From just 10 million gallons of production in 1979, ethanol is now sold in 45 states across the country, is used in more than 15 million cars daily, and the 9 billion gallons of ethanol blends sold in 1990 represents approximately 8% of the total U.S. motor fuel market.

Ethanol blended fuels are approved under the warranties of all 19 domestic and foreign automobile manufacturers marketing vehicles in the U.S. In fact, several of the world's largest automakers, including General Motors and Chrysler, specifically recommend the use of oxygenated fuels such as ethanol in their cars to take advantage of the environmental benefits that come from the use of such fuels.

As a result, ethanol has gained wide consumer acceptance as a high quality fuel additive capable of improving performance and reducing dangerous automobile pollution emissions. In fact, since 1980 more than 950 billion trouble-free miles have been driven using ethanol blended fuels. Ethanol is the most successful alternative liquid fuel ever used in the commercial marketplace and prospects for ethanol's future are brighter today than at time in its history.

The potential for growth in the blends market is tremendous, particularly because of the extensive effort to reduce emissions from gasolines used in the current vehicle fleet. But these same environmental concerns are opening new markets for ethanol as well—in ether markets in the form of ETBE; in mass transit markets; and in neat fuel applications in the form of E-85. These additional markets represent exciting new opportunities for the domestic ethanol industry.

First, over the past several years, refiners have added ether capacity for octane trimming. And as these refiners examine the various options available to meet the oxygen requirements established by the Clean Air Act, they will likely choose to utilize their ether capacity for oxygen purposes. To date, these refiners have used only methanol as the feedstock for ether manufacture, and approximately 1.5 billion gallons of MTBE (methyl tertiary butyl ether) is used in today's gasoline. But the higher oxygen value of ethanol may well require these refiners to rethink their feedstock choice, and encourage them to begin producing ETBE (ethyl tertiary butyl ether) instead.

ETBE can be blended at refineries and shipped through common carrier pipelines. In addition, ETBE can actually reduce the volatility of the base gasolines with which it is blended. While ETBE is not yet commercially available, it promises to be a valuable supplemental market to 10% ethanol blends and a natural competitor to MTBE—the only ether based oxygenate available today.

The second market opportunity beginning to develop is in the area of mass transit vehicles. Under new EPA guidelines, municipalities are required to dramatically reduce emissions from public transportation vehicles, particularly buses. Detroit Diesel has developed an engine for its buses and heavy duty vehicles which operates exclusively on ethanol. One of these vehicles is currently being tested in Colorado. But as most municipalities don't have the resources to replace their entire fleets with brand new alternative-fueled vehicles, Midwest Power Concepts has designed a system which allows transit officials to convert existing diesel buses to operate on a blend of 50% ethanol/50% diesel fuel. The Midwest Power Concepts design dramatically reduces particulate emissions and provides the least cost option for cities to meet the new air standards.

Finally, the President's energy security plan, which phases in a requirement for fleets of ten or more vehicles to be fueled by ethanol, methanol or natural gas, has

rekindled interest in these alternative fuel vehicle technologies. It is interesting to note that if the total volume of ethanol produced last year had been used in its pure (neat) form, rather than as a blending component, it would have been enough to fuel more than one million vehicles for the year.

At the present time, an estimated 8.4 million vehicles in Brazil are operating on pure ethanol. For the past decade auto manufacturers such as Ford, General Motors and Volkswagen have produced cars capable of delivery high performance on ethanol.

In vehicles designed to take full advantage of ethanol's higher octane, higher compression ratio, leaner combustion, higher post-combustion pressure and greater thermal and volumetric efficiency a 30% increase in fuel efficiency compared to gasoline is achievable.

Use of an optimized vehicle fueled with neat (or less so with near-neat) ethanol should allow use of a smaller, lighter engine which delivers the same power as the gasoline-fueled engine it replaces. The weight saved in the lighter engine means that portions of the body structure and the suspension can be made lighter, especially if the engine/vehicle design is done as an entire system. The resulting vehicle will have equivalent power and weigh less than the vehicle it replaces; hence, the resulting vehicle will have better performance. The improved performance means that even further weight reductions are possible if the engine is resized for equivalent performance. The smaller engine will allow powertrain weight and cost savings because the power transmitted will be reduced.

The smaller engine size should lead to a smaller catalytic converter since most emission control systems use a certain ratio of catalyst volume to engine displacement. Also, the lower vapor pressure of ethanol compared to gasoline should result in savings in the evaporative control system.

Ethanol's combustion properties result in less heat being rejected into the engine's cooling system. The lower heat rejection and the cooler exhaust leads to more savings. The neat ethanol fueled engine will have to increase the sensible heat in the exhaust. This will require exhaust port insulation which provided the appropriate exhaust conditions for effective emission control. The fact that not as much heat is rejected into the vehicle's cooling system means that a smaller radiator can be used.

While U.S. auto manufacturers appear committed to methanol (M-85) as the alternative fuel of choice, certainly E-85 will compete for this market as well. Several E-85 cars are operating today—the Nebraska Corn Growers own an E-85 car that the President drove, several other corn growers associations operate similar vehicles, and the Renewable Fuels Association purchased two vehicles for the California Renewable Fuels Council to test in California. All of these vehicles have demonstrated their high performance qualities and low emissions—indicating their promise for the future.

NATIONAL ENERGY SECURITY PROPOSALS

Last month, after more than a year of public hearings on the subject held across the country, the Department of Energy revealed its National Energy Strategy. To encourage the increased use of alternative fuels, which the Department concluded was a necessary component if the U.S. is to achieve the President's objective of a more energy secure America, the Department proposed a program to phase-in a requirement for centrally-garaged fleets of ten or more vehicles to use alternative fuels. Specifically, the following percentages of alternative fuels will be required:

1995, 10 percent;
1996, 15 percent;
1997, 25 percent;
1998, 50 percent;
1999, 75 percent; and
2000 and after, 90 percent.

There are approximately 5 million fleet vehicles which could be affected by this provision. Thus, depending on the alternative fuel used, the following levels of alternative fuels will be required:

1995, 350 million gallons;
1996, 525 million gallons;
1997, 875 million gallons;
1998, 1.75 billion gallons;
1999, 2.62 billion gallons;
2000 and after, 3.15 billion gallons.

While certainly a good start, this program does not represent the most that this country can do to reduce our dependence on imported oil. Far more can be done to increase the development and use of alternative fuels, such as ethanol. Other fleet vehicles could be included, incentives to convert existing vehicles to operate on alternatives could be established, and a far greater emphasis could be placed on utilizing blends of alternative fuels with gasoline. An aggressive blended fuel program would enable the 170 million vehicles on the road today to contribute to energy security without costly changes to technology or fuel distribution systems.

By focusing only on the limited introduction of alternative fueled fleets, the Department's plan ignores the potential and the flexibility of fuels such as ethanol. Yesterday, Senator Jeffords introduced a bill which recognizes the benefits of blending alternative fuels with gasoline, and establishes a program to phase-in the increased use of alternatives in gasoline blends, in ethers, and in fleets—allowing the marketplace to determine how each of these technologies will fit in the motor fuel market of the future.

Specifically, the bill requires gasoline manufacturers to dedicate a fixed percentage of their production capacity to domestic, non-petroleum resources. A refiner may choose to meet its requirements within its own product mix or through the trading of marketable credits with other fuel providers. The bill defines "replacement fuels" as those capable of being mixed with gasoline and used in present gasoline engines. "Alternative fuels" are those not compatible with gasoline, for which distinct combustion engines are needed. The required replacement is 10% by 1998, and 30% by 2010.

The Renewable Fuels Association enthusiastically supports this approach. We believe the Jeffords bill will result in tremendous growth for all alternative fuels by creating market opportunities for replacement fuels in fleets, for blends in the existing gasoline infrastructure, and ethers as gasolines are reformulated to reduce pollution.

CONCLUSION

While recognizing ethanol's role in the future as a feedstock for the production of an ether (ETBE), and the marketplace opportunities for E-85 or E-100, the primary market for fuel ethanol is as a blend component with gasoline. Ethanol blended fuels have three major advantages over other alternative fuels, such as natural gas, propane or methanol:

First, ethanol blended fuels are available today in 44 States, at more than 600 terminal locations and marketed by an estimated 2,000 gasoline marketer/blenders. Ethanol blends are also dispensed from conventional service station pumps.

Second, ethanol blended fuels can be used in existing vehicles without modifying the fuel system. Ethanol is recommended by all 19 auto manufacturers as a safe, high performance fuel additive.

Third, ethanol blended fuels are priced competitively with non-oxygenated fuel products.

As a result, ethanol will continue to play an important role—helping to create new value added markets for our farmers, enhance our nation's energy security with domestically produced, renewably derived alternative fuels and assist in the monumental task of cleaning up our nation's polluted air.

Thank you.

The CHAIRMAN. Mr. Vaughan, first of all, please do not report that I am against ethanol; I am not. What I do fear is that when you take the subsidy plus, and you have already got the 1.2 miles per gallon CAFE credit cap, which the administration says they want to take off, which really is an additional subsidy, you understand, under the CAFE law.

And if they require these purchases by 1995 for alternative fuels, and if you can make the change for ethanol at $200 to $300 an automobile, whereas natural gas may require much more, in that sense it seems to me that this is an ethanol bill; the administration bill is an ethanol bill. Would you attack that logic?

Mr. VAUGHAN. I will not attack it; I will try to respond. This is very similar, and I think Senator Wirth was trying to get to a

point earlier with Secretary Stuntz. The administration's energy initiative in alternative fuels is very similar, strikingly similar, to what they initially suggested as part of their clean air package. And their approach is to look at the cheapest source of international alternative fuels. That cheapest source today is imported methanol; that is the fuel that many people believe was the single fuel choice.

By the time that initiative hit the Congress, it was greatly changed, greatly reduced in its size, its stature, from a blends program for carbon monoxide. And a reformulated fuels initiative for the ozone program became the operative. And a much, an emaciated alternative fuels initiative finally made it through the process.

What the administration is talking about now is, my understanding and my reading of it is, to promote the utilization of the cheapest form of imported or domestic alternative fuel. And by far and away today, that is methanol.

Unfortunately, much of the world's methanol sources are offshore. We are going to trade off oil dependence, which is already too high, for a dangerous level of increased methanol, and potentially even methyl tertiary butyl ether dependence. So in other words, we are going from dependence on the bottom level of the barrel of crude oil to the top level, to these refined products, which is going in exactly the wrong direction.

The CHAIRMAN. Yes.

Senator Wirth.

Senator WIRTH. Thank you very much, Mr. Chairman. I unfortunately have an executive committee meeting of the Armed Services Committee, and I am going to have to go. But I just wanted to thank this distinguished panel, particularly the last three speakers, for your strong advocacy for what I think is absolutely the direction in which we ought to be going.

Tomorrow I will be introducing a pretty broad-gauge piece of legislation focused on energy efficiency and alternative fuels, picking up a lot of the experience you have had in Texas, the fleets that you were speaking of, Eric, in the California proposals. And I look forward to your reactions to those and to working on that.

I thank you, Mr. Chairman, for your consistent advocacy both for natural gas and for a more aggressive fleet provision. I am sorry I cannot stay and be with you for the rest of the afternoon, but I really appreciate your being here. Thank you very much, Mr. Chairman.

The CHAIRMAN. Thank you, Senator Wirth.

Ms. Batts, you heard Mr. Krueger talk about his school buses, which can pay for their investment in 3 years. Now why does that not make sense for us to mandate to fleets like school buses that they do the same?

Ms. BATTS. Well, again, I think we have to understand the school bus is not a truck, and you will hear, well, they both run on diesel engines. But they are not the same diesel engine, and you are not asking the vehicle to do the same thing. That program has been preceded by a lot of demonstration projects in the school bus fleets and in other bus fleets.

Up until 3 years ago, when you passed the alternative fuels program, there were not any alternative fuel programs even looking

at heavy duty trucks. We are just in the process of beginning that stage now. We have not had a lot of luck. The diesel engine used in the truck today, the commercial truck today, is different. And when you look at these alternative fuels, they are not concerned about the capacity of the fuel tanks; we are.

You put, you have got a straight truck, it is down here in the loading dock of this building. And if we have got to put more fuel tanks, that means we do not put any more freight on. In fact, if you look at things like the garbage trucks today, what six garbage trucks can haul today, if we have to go to compressed natural gas, we are going to have to have seven garbage trucks. Because we are going to take that much capacity out of the freight-carrying capacity of those vehicles.

It has a tremendous impact on the bottom line of what the trucking industry is trying to do.

The CHAIRMAN. Let me ask Mr. Krueger, do you have to have seven school buses where you used to have six?

Mr. KRUEGER. I am told that in the case of Garland, what they do is they have these 60 school buses, and they, I believe, have added 20 more since then that are alternate, that are CNG powered. And while they can use either fuel, I am told by the manager of this division that 90 percent of the time plus, they are running in fact on CNG.

Now they do——

The CHAIRMAN. No, what she said was that it takes, I guess, one-seventh more capacity to put the tanks——

Mr. KRUEGER. In the case of school buses, no, there is not that problem. There is not that problem for school buses. But I will say, in fairness to her, that it is my understanding that basically it requires 4 to 4.5 times the space to fuel with CNG than it would require for gasoline.

So CNG does require larger tanks, and there is a weight addition that is required. And I would grant that. I think that is one of the trade-offs that we have at this time, although I also would expect that with the development of technology that might lessen.

The CHAIRMAN. Let me ask you, we have a law called PURPA. I do not know whether, I think you were here when we passed PURPA, which requires utilities to purchase the energy, the electric energy from a qualified facility at the avoided cost. And if they can show that they can produce it at what the utility would have to otherwise pay for it, then they must purchase it.

Is there any need in us trying to pursue sort of an avoided cost proposal here, so that if, say, a natural gas producer comes to a fleet owner and says, look, I will sell you natural gas at a price that you can pay for this for X years, and in effect require them to do that if the producer can demonstrate that.

Is there, what would be wrong with that? First of all, Mr. Krueger, and then Mr. Pickens. You understand what I am saying?

Mr. KRUEGER. If I understand what you are saying, I think that is in fact what is being offered by, without even Government direction to do so, by a major gas pipeline company in Texas. That is, they have written to these school districts and said, we will install the facilities, we will pay the cost of conversion; give us a 3-year contract and we will then provide you CNG for these vehicles at

less than the comparable cost for gasoline, and we will take all of the costs.

So that they are so confident of being able both to provide CNG at that cost and still to make it economically desirable that they are willing to do that. And it might well be, Mr. Chairman, that some type of trade-off such as you suggest, of credits would work in exactly that way.

The CHAIRMAN. Well, of course, Texas is different; they love natural gas in Texas. These are governmental bodies and they can sort of afford to take the gamble. What would be wrong with that, Mr. Lefever?

Mr. LEFEVER. Well, first of all, we are not aware that anyone has ever made such as offer, other than in the rarest demonstration project case. For example, the highly touted United Parcel Service arrangement with Brooklyn Union Gas in New York. That was a very good arrangement.

Other people have gone to Brooklyn Union and said, I'll take that deal. The Port Authority of New York and New Jersey is anxious in one of its airports to have a very similar arrangement. They have had lengthy discussions. Brooklyn Union is not in a position to offer that to everyone. That is subsidized, special arrangement where everything will be taken care of and they are sure is going to work out is quite rare.

In fact, on the contrary, a major package delivery company that we would all know is trying to open a CNG facility in this city. They have received this month estimates that it would be, a bid, a written bid, that the cost was going to be over $500,000 for the fueling facility to fuel 100 vans, and that the cost to convert each van was going to be almost $3,000. And they acknowledged that it would not be possible to recover just the cost of the fueling facility in less than 6 or 7 years.

Since the utility, since the delivery service does not keep the vans that long, that is a very serious problem. And that is the kind of thing that we see much more of. It may be that market forces will change 5 years from now, but today we do not see any reason, or we have not seen any sign that arrangements of that sort are working out.

Ms. BATTS. Mr. Chairman, if I could add to that, I think that that is important, and I am sure that with the bus example that that is true.

But when we have looked at all of the costs together, and we have spent a number of, we have done some studies that do not just look at the cost of gas, of the fuel vis-a-vis diesel and some of the others, but what does it cost you when you actually put them into the fleet? What does it cost us for the refueling facilities. What does it cost us for the new underground tanks?

Senator Wallop was making the comment. We looked at it; it is $750,000 to put in the fueling station, to go to CNG for a fleet of 10 trucks. That is after we have already told the trucking companies to rip out all their old fuel tanks and the EPA requirements and put in the new ones. These are not easy to come by. And we have to end up buying more trucks, because if we want to move X amount of freight——

The CHAIRMAN. Well, we understand that, but in other words, you dispute the fact that you could do with your vehicles what Texas has been able to do with its school buses?

Ms. BATTS. I submit that trucks are different from buses, and there has been little if any research done into alternative fuels such as are being proposed today in the commercial trucking business. We have not seen it; we are anxious to look at it. We have spent a lot of money.

The only thing at this point that has any attractiveness to us is the clean diesel option which the Clean Air Act allowed.

The CHAIRMAN. We understand that. Mr. Pickens, let me ask you, what would be required to get these people to understand that, I mean, are the economics there now?

Mr. PICKENS. Of course, we think they are, but I am not an expert in the trucking business either. But let me speak to something I think we are totally, that has not even been put on the table at this point. I think a very important point is who is it that finds and produces the natural gas? It really is the independent producer in the United States.

And let me just speak to that a second. The rig count in 1981 hit an all-time high, which was in December, the third week in December of 1981, there were 4,531 rigs operating in the United States. We hit a low point in 1986, I believe it was 824 rigs. And today we have about 900 rigs operating, 20 percent, and I think we will go back to 800 rigs here within the next 6 months.

But we have got 20 percent of the rigs operating today in the United States that we had in 1981 at the high point. What does that mean to us? Well, the first thing is that we have absolutely wiped out the, about 60 percent, 40 percent of the independent producers in the United States. The major oil companies have basically abandoned, with their budgets, the continental United States where the natural gas is that we are talking about.

So now we are down to 60 percent of the producers or independent operators that we had in 1981. Independents are truly going the route of the passenger pigeon; I mean, they are going to be extinct unless something is done. So we are really talking about a timing problem for the people that are going to provide the gas for you.

Now I will just give you an example, that Mesa, the company I am associated with, in 1990, we had, our operating losses were over $100 million. We are primarily a gas producer. So the ones that are going to provide the superior fuel that there is so much testimony given for, then somebody has got to speak to it. I am not talking about a tariff here; I am not, that has not been something I am for. What I am talking about is demand, is getting gas demand up.

The CHAIRMAN. We are anxious to do that. We are trying to figure out how to do it.

Mr. PICKENS. Well, my point is that we have got to figure out something pretty quick, or the people that are going to provide this for us are going to be gone. And so——

The CHAIRMAN. Ms. Batts does not want us to require her people to do it, nor does Mr. Lefever.

Mr. PICKENS. Well, I still believe that you have got to start with an infrastructure that kicks things off. Now, we already have seen,

and I am pretty critical of the automobile manufacturers in America, because they have had market share taken away from them by the Japanese and I do not believe that should have happened.

But here we have got the automobile manufacturers dragging their feet one more time saying, "Well, get the infrastructure in place and then we will get the vehicles for you." Somebody is going to have to move, and I believe that what triggers it. I have already been told by those here in Washington that converting the fleet of Government vehicles over is not going to provide enough demand to cause all this to happen. I think it will be the trigger, that if we could move in that direction, that the infrastructure would start to fall in place.

Well, I probably have a heck of a lot more confidence in the entrepreneurs in America. When they start to see the opening, and they see the Government switching vehicles over, buying only CNG vehicles in the future, that what will happen to us is that you will see the entrepreneur start to move in and develop the infrastructure.

The CHAIRMAN. Well, speaking for myself, I have no hesitancy at all in requiring maximum response from the Government, whatever that maximum is, we clearly ought to require that, I believe.

It is going behind that and requiring school buses, whatever, that is the thing that worries me. I am inclined to think we need to have some tax incentives.

Mr. PICKENS. I agree.

The CHAIRMAN. I think Mr. Andrews' bill makes a lot of sense, at least in its direction. I do not know about the details of it. We do not have jurisdiction over that, and even when this spills out on the floor, we would not have jurisdiction over that.

But I think you clearly need some kind of incentive, because you have got tremendous capital investment to begin with, and my guess is the numbers just would not work for most trucks. Probably school buses are, in Texas, a special circumstance, a little bit different. I imagine you cannot quite stretch those numbers out enough to convince these people to do it.

Mr. KRUEGER. Mr. Chairman, one of the things that I was told when I inquired of the Garland independent school district about this, he said we actually saved labor costs, among other things, because he said they simply come in and they fuel-feed, they just hook up 60 tubes to them overnight, and they automatically are shut off. And he said we have less labor than would otherwise be involved, and he said, "So we have a saving there, in addition to the fact that we go twice as far without oil change, twice as far without filter change, and have no sparkplug problem."

So I think that there are a lot of savings that are attendant to this conversion to CNG. And I am not sure where Ms. Batts' numbers come from, but the numbers that I have given are the numbers that were given to me by the experience of this school district. And you know, it has been a 9-year experience.

And of course, we in America have, I am told, 30,000 CNG vehicles. But I am told there are over 600,000 worldwide. So we need to look not only to Garland, Texas, but we can look to New Zealand and Italy and France and Australia for the experience of dealing with CNG.

The CHAIRMAN. What should the bill require in this respect?

Mr. KRUEGER. I would see first myself a requirement on the Federal Government. In fact, when I was in the House, people always resented legitimately if we passed legislation in which we exempted ourselves, as was often the case. But I think in this case, let us require the Federal Government first. Let us put it on fleets such as, anything, let us say the metropolitan transit authorities. They have gotten a good deal of Federal benefit in the past. Let us look at school districts, because they are simply refueled, and we may not need to require every vehicle in the fleet initially to have this capacity, but I think that is a place to look.

Let us look to State governments that get Federal assistance. And I think as we establish the infrastructure to serve these and gain experience, we can then assess more accurately whether there is going to be a private market for it.

Again, one of the encouraging things is that General Motors is now manufacturing a three-quarter ton pickup that will go, at least they claim, 200 miles on CNG. And I think that is a positive step that they have moved in that direction.

The CHAIRMAN. Do you know what the cost of that addition on that increment for CNG is for that truck?

Mr. KRUEGER. The cost of the vehicle?

The CHAIRMAN. No, for the tank. For the retrofit.

Mr. PICKENS. Can I respond to that one?

Mr. KRUEGER. Sure.

Mr. PICKENS. I think actually that there is no added expense for it. And I am not talking about retrofitting. I am talking about a new vehicle.

Mr. KRUEGER. These are new production-line vehicles that GMC Truck is now beginning to make. And I am told, again, that it adds 150 pounds to the three-quarter ton truck to have the necessary CNG parts.

The CHAIRMAN. And it does not cost anything more than a gasoline vehicle?

Mr. KRUEGER. I cannot tell.

Mr. PICKENS. I am told it does not. And there are going to be 5,000. I will tell you who I got that information from. It was our State land commissioner in Texas, Gary Morrow. And I was in his office 2 weeks ago and he told me they had gone up from 1,000 trucks to 5,000 trucks on the CNG. And he said it is no more cost to produce that vehicle.

The CHAIRMAN. Well, we will need to find the answer to that.

Mr. KRUEGER. I will be glad to get that information for you.

The CHAIRMAN. Senator Wallop.

By the way, Mr. Pickens has to leave at 4:30 to catch a plane, so if you have any questions of him, you might direct them to him first.

Senator WALLOP. I will, but let me make a couple of observations. One is that it works better for a school than it would for the ordinary trucking firms because all of the schools buses go back to the same lot at night, and that central fueling is a little different than a truck that is 200, 500, or 800 miles from home and going on, and looking for similar kinds of things.

So it is clear that the economics of those two things are not comparable. And it is a bit misleading. I do not mean to accuse you of being misleading, but it is a bit misleading to try to compare them just off the top.

Mr. Pickens, you are here, among other things, representing independent producers. You correctly said you were wearing two hats, and I can understand them both. For the edification of the committee, would you share with us how the provisions of S. 341 affects independents and majors differently. I am particularly interested in your views on the fleet conversion provisions of the administration's national energy strategy.

Mr. PICKENS. S. 341?

Senator WALLOP. How S. 570 affects independents and majors differently.

Mr. PICKENS. You are going to have to help me with that one, how it affects independents and majors differently?

Senator WALLOP. Then what about the national energy strategy?

The CHAIRMAN. S. 341 is our bill and NES is the administration's.

Mr. PICKENS. Start me off, because I cannot remember how independents and majors are treated differently. Or just the difference in the two categories, and not how you treat them differently in the bill? Is that correct? Do you treat them differently?

Senator WALLOP. Well, I do not know. I have been led to believe that you felt that the independents were being——

Mr. PICKENS. No, I do not think you treat them differently. What I see the difference between——

Senator WALLOP. What about the administration bill?

Mr. PICKENS. Well, the difference I see between independents and majors and why today majors do extremely well is because they are integrated. They have an upstream operation, which includes a tremendous amount of oil. And they are big gas producers. The independents are primarily gas producers and not oil producers.

Second, you have got the downstream operations of the majors which are doing very well. Very frankly, I have been critical of their pricing of gasoline and that the price of oil goes down to $15 a barrel and you never feel that at the pump. You may feel $20 a barrel when the price is $15, but you never get clear down to $15 as the price gasoline.

So the majors do extremely well. The independents do not participate in that because there are no more independent refiners in the United States. They have been pretty well squeezed out. And what is happening today is the independent producer is being squeezed out, too.

So I see a vast difference between majors and independents. And when I see Senator Metzenbaum come up with the windfall profits tax that, because of what happened on profits to major oil companies in the fourth quarter, and characterize it as the oil industry, I fall out of my chair. I lose $100 million last year and we do not fit in that category.

I would love to have something in your bill that differentiated between independents and majors; that people understand it is two different categories totally. So I am not here talking for the majors.

They have plenty to say for themselves. I am not talking against the majors, but I am speaking on behalf of the independents.

Senator WALLOP. Well, I think I understand that, and I think Senator Johnston understands that.

Mr. PICKENS. I know you do, because you are both from producing States.

Senator WALLOP. With all respect to our colleague from Ohio, he is not a renown economist when it comes to the energy industry. [Laughter.]

Senator WALLOP. He is a renown spokesman, but not a renown economist.

Do you support the use of other alternative fuels like propane and national gas liquids as alternative fuels?

Mr. PICKENS. I do. Methanol is an import problem and it also has an emission problem. And so I cannot believe that methanol has gotten as far as it has. And I agree with Senator Johnston on ethanol. I am not against it. It is just too expensive. And you are sitting here with the cheapest fuel of all, but if you want to use butane or propane, we use those in our company vehicles, along with compressed natural gas.

So all of them are good, clean-burning fuels.

Senator WALLOP. Actually, my friend from Colorado might be surprised to find that we run our irrigation pumps with propane.

Mr. PICKENS. Sure.

Senator WALLOP. We run one of the two ranch trucks with propane.

Mr. PICKENS. If you cannot get natural gas, propane is great. We use a lot of it too for our irrigation pumps in Texas.

Senator WALLOP. Actually, where we are we cannot.

There is another thing that I would just make an observation on here. In order to get the maximum response out of the Government on these fleets conversions we are going to run smack dab into the budget agreement. Where you find money to retrofit is going to be mystical to say the least. The problem that we have is we take something out of one hide in order to provide a skin graft to another entity. I think that is going to be difficult for us to work in terms of retrofit. New vehicle purchases I think would work.

Mr. PICKENS. One thing on that, where there are a lot of things that I know go in the budget, and I am certainly no expert on this one, but this one to retrofit does pay for itself by the savings in the fuel costs. Not immediately.

Senator WALLOP. You are an old friend of mine and you are a businessman. You live in the real world that Government does not know about. Nobody would devise a budget system for their own company that we have devised for ourselves to operate under.

Mr. PICKENS. I have suspicioned that.

Senator WALLOP. But long-range cost realization is not within our grasp no matter how practical it is, because the CBO scores things as to what they cost this year, and how much you might save next year just does not enter into any picture. It is not within our reach. Even if it were within our reach, as a Congress, it would be claimed by the appropriations committee.

So I am sitting here frustrated by the idiocy of what we have done to ourselves as a Nation with the budget process. It is worse

than what we have failed to do for ourselves with an energy strategy, and to try to match logic with this strategy is almost beyond our reach. But we will try.

I appreciate what this panel has said, Mr. Chairman. The distribution is going to be difficult. You start mandating it and, as has been pointed out by Mr. Lefever, there is a fairly enormous cost in mandating to a distribution system that they have to convert.

Mr. LEFEVER. Mr. Wallop, in addition, I fear that as you look at this you are going to find there is an addition problem beyond money. It is easy to perhaps think that a large percentage of the Federal Government fleet could be converted or that you could buy next year's cars that would run, for example, on CNG. But, as a practical matter, most every sedan that I have seen that runs on CNG gives up the trunk space. That is where you have to put the extra tanks.

When we met with people knowledgeable in the natural gas field they tell us that cars will be redesigned in the future so that those tanks will be somewhere. But the problem that we face today, and frankly I think your Federal agencies are going to face, is if you have to convert a gasoline vehicle and somehow fill the trunk with the CNG tank to make this conversion, you have greatly reduced the utility of that vehicle. Certainly for the corporate and service work that NAFA members are in, you have reduced the utility completely.

Drug salesmen and people that are repairing computers and things have to have that space in the trunk. So cost is one factor, but especially as we move this up sooner, if we move this up even earlier than what we were already planning for these alternate fuels, if we move it up to 2 years from now or 3 years from now, it will take massive vehicle design or some great creativity for where we are going to hide these tanks for the great bulk of vehicles which are still cars on the road.

It is not like a truck that you can just add a few extra tanks in the back. There are a lot of technical problems.

Senator WALLOP. There is another interesting thing that just occurred to me, Mr. Chairman, in terms of scoring. I understand that the State of California is already beginning to be a little bit concerned about the loss of revenues from the gasoline tanks that might come with this conversion. I am assuming that somewhere along the line some smart aleck in CBO is going to say that there is a cost to mandating this thing because of the new increase in the Federal Gasoline Tax that will reduce Federal revenues.

I do not know that to be the case, but I fear that that is going to be the case.

Mr. PICKENS. I bet you there is also a smart aleck that figures out a way to tax the gas, too, which will offset the gasoline costs.

Senator WALLOP. It will offset the gasoline costs, but it will also begin to offset the price advantage that it now enjoys.

Mr. PICKENS. When you talk about it takes up space in the trunk, I have a CNG vehicle. I just pack lighter when I go someplace. I do not take as many bags as I used to take. But it does get you off of the dependency on foreign crude oil. And I think the people in this country are ready to make some sacrifice to get away from that. So if it means a smaller trunk for a period of time until

we can figure out how to compress the gas even greater to get a smaller tank and put it someplace else in the car, I think people are willing to consider that. At the same time, it is cheaper.

I apologize for leaving, but I do want to make one last comment. I have appeared before both Senator Wallop's and Senator Johnston's committees in the past. I remember some of the questions we had that, I do not know about you, but I kind of struggled with the question as to whether we were on the right side of the issue or we were not on the right side of the issue, and it opened up tremendous debate. This one, I basically find everybody on the same side of the issue; that you are really coming down to what kind of timing that we are faced with.

But we are not arguing with each other. When I make a point you all say, wait a minute, I say the same thing in our bill, or something else. I think we are in agreement. I just do not want to lose the independent producer in this whole process because it takes too long for us to decide that we do have a question here that we can answer rather quickly and move in that direction.

I think the infrastructure goes for the truckers, that it will come. And my feeling is that truckers will be delighted with the CNG fuel as to how it operates and what it provides for them and everything else. I understand their problem and I can sympathize with it. But we are headed in that direction and it is going to happen. And I just encourage all of us to sit down and figure out how quickly we can do it.

Senator WALLOP. One has to assume that this new diesel is also considered an alternative fuel. Is it not, Ms. Batts?

Ms. BATTS. Well, in the clean air bill, clean diesel is along with a number of other items, which indeed include the gases in that. At no point have we sat and said we do not want this alternative fuel versus that alternative fuel. What we know is we have got a deadline now by 1998 on what we have to do.

We are working towards that. We do not know what is going to come out, because while there has been lots and lots of research done in automobiles, and understand the term that is constantly being used, there has been little, if no work, done in the heavy-duty truck field. And that is what we want to know. I know that compressed natural gas works in a car. Nobody has yet tried to run an 80,000-pound truck and run it economically with a durable engine that is reliable.

We would like to know that first. That is what the purpose of doing the research that this committee asked for 3 years ago, which is just in the final stages of signing the contract so we can do it, so we can run them in a variety of different climates under a variety of different scenarios, with different kinds of trucking companies. I do not know what is going to turn out. My hope is that we have a lot of options. I think when we have got a lot options that competition works to its best, and we will end up with the best fuels.

We are looking at not only fuels, but also engines. And we have yet to see a marrying of the fuels which are being discussed today with the engine that is going to run them. And that is why we are different.

Senator WALLOP. Mr. Chairman, I just would conclude my questions by saying, Mr. Lefever, your points that were made in your complete testimony about the anxiety that people have of making these capital investments in light of and in face of the Clean Air Act requirements with regulations not yet down is very real. A lot of people are going to have to understand that we are playing on all kinds of fronts and nobody is focusing on them except the people who are the object of these fronts.

Everybody will have to look at what the consequences of two separate tracks running sometimes parallel and sometimes not so are. But the risk is of making major capital investments only to be told that that was the wrong one. This is all too common in this Government of ours today. And I think we really need to pay attention to it.

Mr. VAUGHAN. Senator, if I could add just one comment, and I know it is not specifically related to the natural gas issue or the logistics point you were trying to make, but this identical debate took place during the course of the clean air bill: Should we require alternative-fueled vehicles, replacement-fueled vehicles?

Senator WALLOP. But now you have got two separate things in place.

Mr. VAUGHAN. I understand.

Senator WALLOP. If this one passes, you have got that one already passed, and they may not parallel each other. And you are going to ask the people of America who are in business to run the risk that that investment that they have chosen to the best of their ability is not going to satisfy somebody's regulation. They are either going to be fined or find their investment to be worthless.

Mr. VAUGHAN. There are multiple choices, obviously, but there appear to be two right now. One is alternative-fueled.

Senator WALLOP. Yes, but it is a bad one if you happen to choose wrong and invest your money. That is my point.

Mr. VAUGHAN. I understand.

Senator WALLOP. I do not care how many choices there are, so long as the risk is out there. Having chosen, you have been told by Mr. Reilly or Admiral Watkins, or somebody else, that was the wrong choice. I am sorry. Go back and invest again. That is the best of circumstances.

The worst is that you get fined, too.

Mr. VAUGHAN. What the Congress did, again, during the course of the clean air bill was to attempt to get as many clean-burning alternative fuels as replacements that are compatible with the vehicles, can fit inside the current distribution structure, are part of the current fuel logistics change, and are cost competitive.

Senator WALLOP. I was there. I was part of that Congress.

Mr. VAUGHAN. I understand, sir.

Senator WALLOP. All I am telling you is that you are dismissing a risk that the business people of America cannot afford to dismiss.

Mr. VAUGHAN. I would strongly encourage you though to follow on with the same plan that you have just enacted. There is no rational reason whatsoever to go out and implement an alternative fuels requirement on the basis of what the administration has put forward. First of all, it is a minimal initiative, with maximum risk

on a very few number of people. When you have got maximum fuel potential, maximum energy security potential——

Senator WALLOP. Better if we are hurting all Americans instead of a few of them?

Mr. VAUGHAN. Well, 170 million running on a variety of alternatives as replacement fuels, as blend components, would have preferable long-term implications that would be very positive for Americans.

Senator WALLOP. Mr. Vaughan, I hear what you are saying. But I think we have an obligation to look at the consequences of what we are doing, and to see that we do not create adverse economic risks on the people of America while we are trying to solve another problem. We just have that obligation, and I think Senator Johnston and I will be looking at it pretty carefully.

Mr. VAUGHAN. One last point if I could. When the lead debate was raging in the late 1970's and the early 1980's, we finally got lead out of gasoline, good, bad, or indifferent, the oil companies, unbeknownst to the——

Senator WALLOP. You are not hearing the risks that were identified by Mr. Lefever.

Mr. VAUGHAN. I understand.

Senator WALLOP. I know about the lead debates. I know about all of these things. But you are talking about two separate sets of requirements, both of which carry consequences for making wrong choices.

Mr. VAUGHAN. What I would strongly suggest is going and following——

Senator WALLOP. Which may be in conflict with each other.

Mr. VAUGHAN. Just following the lead or the suggestion that Senator Jeffords put on the table and I think Mr. Wirth is going to be offering tomorrow, which looks more at replacement fuels that blend components, things that are compatible with the vehicles on the road today. Not forcing vehicle fleet operators or truck operators, or anyone for that matter, forcing them to purchase vehicles that they may or may not be able to find fuels for.

Senator WALLOP. That is fine so long as we can drop the $1.25 subsidy that goes with your fuel.

Mr. VAUGHAN. Well, there is not $1.25 subsidy. It is 54 cents, and it goes to the oil companies. And as you know, and as the Congress extended that incentive last year, and now even the Office of Management and Budget endorses, the analysis that the Government saves somewhere between $450 million and $650 million a year net savings to the Federal treasury. It is probably the most cost-effective subsidy or incentive you have ever put in place in the Congress.

And if it does take all of the corn available in the State of Iowa, just to allay your concerns about corn flakes, we only take the starch. We leave behind all the food and feed potential, so all those pigs get happy and they all get slaughtered and we all get fat and happy on the pig meat that we eat.

Senator WALLOP. Some of us are not so persuaded that it is that efficient.

The CHAIRMAN. Well, I want to thank all witnesses. I have one further question of Mr. Krueger, who is a Shakespearian scholar.

Some wag on the staff gave me this question to ask you what meaning you might find in this quotation from Shakespeare.

> Like as the waves make toward the pebbled shore, so do our minutes hasten to their end.

Mr. KRUEGER.

> "Each changing place with that which goes before,
> In sequent toil all forwards to contend.
> Nativity, once in the main of light,
> Crawls to maturity, wherewith being crowned,
> Crooked eclipse 'gainst his glory fight,
> And time that gave doth now his gift confound.
> Time doth transfix the flourish set on youth
> And delves the parallels in beauty's brow.
> Feeds on the rarities of nature's truth,
> And nothing but his scythe can mow
> And yet to times in hope my verse shall stand,
> Praising thy worth, despite his cruel hand."

I praise thy worth for holding this committee and thank you very much.

[Applause.]

[Whereupon, at 4:40 p.m., the hearing was adjourned.]

APPENDIXES

APPENDIX I

Responses to Additional Questions

U.S. SENATE,
COMMITTEE ON ENERGY AND NATURAL RESOURCES,
Washington, DC, March 22, 1991

Hon. LINDA G. STUNTS,
Deputy Under Secretary, Office of Policy, Planning, and Analysis, U.S. Department of Energy, Washington, DC.

DEAR DEPUTY UNDER SECRETARY STUNTS: I want to thank you for your testimony Wednesday before the Committee on Energy and Natural Resources on Title VII of S. 570 dealing with alternative fuel fleets.

As a followup to that hearing, I am enclosing some questions to be provided for the printed hearing record. I am requesting that the answers to these questions be provided to the Committee no later than March 29, 1991.

Thank you again, and I look forward to working with you in the future.

With warmest personal regards, I am,

Sincerely,

J. BENNETT JOHNSTON, *Chairman.*

[COMMITTEE NOTE: The answers to the following questions requested of Ms. Stuntz, by the committee, were not received at the time the hearing went to press.]

QUESTIONS FROM SENATOR J. BENNETT JOHNSTON

AVAILABILITY OF ALTERNATIVE FUEL VEHICLES

1(a) About how many vehicles are currently owned by fleets covered by section 712(a)(1) of S. 570?

(b) About how many vehicles are acquired by fleets covered by section 712(a)(1) each year?

(c) For each year 1995 through 2000, about how many vehicles acquired by covered fleets would need to be alternative fuel vehicles under section 712(a)(2) of S. 570?

2(a) About how many buses are currently owned by fleets covered by section 712(b)(1) of S. 570?

(b) About how many buses are acquired by fleets covered by section 712(b)(1) each year?

(c) For each year 2000 through 2003, about how many buses acquired by covered fleets would need to be alternative fuel buses under section 712(b)(2)?

3(a) For each alternative fuel (i.e., methanol, ethanol, compressed natural gas, liquefied petroleum gas, hydrogen, and electricity), how many vehicles are now produced by domestic auto makers?

(b) How many alternative fuel vehicles does the Clean Air Amendments Act require domestic auto makers to produce for the years 1995 through 2000?

4. Why does S. 570 not include a provision, comparable to section 249(c)(1) of the Clean Air Act, as amended, requiring alternative fuel vehicles to be produced?

5. Section 713 of S. 570 provides an exemption from the purchase requirements of section 712:

. . . if the Secretary determines that no alternative fuel vehicles meeting the fleet requirements for that person are available for purchase lease or acquisition. . . .

How broadly or narrowly would the Secretary interpret this authority? For example, it was stated at the hearing that it takes between 4.0 and 4.5 times as much space to carry compressed natural gas than gasoline, reducing the space available to carry cargo, and necessitating the fleet owner to use 7 trucks to do the work formerly done by 6. If that is the case, would the Secretary determine that the available alternative fuel vehicles do not meet the fleet owner's cargo-carrying requirements, thereby entitling the fleet owner to an exemption under section 713?

AVAILABILITY OF ALTERNATIVE FUELS

6(a) Why does S. 570 not provide an exemption from the purchase requirements of section 712 for cases in which alternative fuels are not available, comparable to the exemption for vehicle unavailability in section 713?

(b) Could a provision be added to S. 570—without defeating the purpose of the fleet program—to exempt fleet owners from section 712 if alternative fuels are not available or if the cost of installing refueling facilities places an unreasonable economic hardship on the fleet owner?

5. Both the Alternative Motor Fuels Act and the Clean Air Amendments Act require federal agencies that refuel federal vehicles with alternative fuels to offer to sell such alternative fuels to the public. Would federal facilities still be required to provide this service to all alternative fuel vehicles required to be purchased under section 712 of S. 570?

6. Why does S. 570 not include a provision, comparable to section 246(e) of the Clean Air Act, as amended, requiring fuel producers to make alternative fuels available?

STATUS OF ALTERNATIVE FUEL DEMONSTRATION PROGRAMS

7(a) Please provide the Committee with a synopsis of the status of all alternative fuel demonstration programs under the Alternative Motor Fuels Act of 1988 and the Clean Air Act Amendments.

(b) Please also provide a synopsis of all state, local government, and private alternative fuel programs, to the extent the Department has knowledge of them.

COST IMPACT ON FLEET OWNERS

7(a) The General Service Administration estimates that it would cost the Federal Government $40 million more to buy and operate 12,000 alternative fuel vehicles than the same number of gasoline vehicles. Do you expect similar cost increases for the private sector under S. 570?

(b) Has the Department prepared any estimates of the likely impact of the program on fleet owners? E.g.:

The initial purchase price of alternative fuel vehicles compared to gasoline vehicles;

Maintenance and repair costs of alternative fuel vehicles compared to gasoline vehicles;

Fuel costs for alternative fuels compared to gasoline;

The cost of installing or replacing refueling facilities; and

The resale value of alternative fuel vehicles compared to gasoline vehicles?

ADMINISTRATION AND ENFORCEMENT

8. The alternative fuel fleets program established by the Clean Air Act Amendments would be administered by the States. S. 570 neither directs the States to administer the proposed program nor provides for an administrative mechanism within DOE. How would the program be administered and enforced?

9. If a fleet owner violates the purchase requirement of section 712, does each vehicle constitute a separate violation? For example, if a fleet owner buys 100 vehicles in 1995, only 8 of which are alternative fuel vehicles though section 712 requires that 10 should be, has the fleet owner committed one violation or two?

9(a) Why does S. 570 neglect to require alternative fuel vehicles to actually use alternative fuels?

(b) As now drafted, could a fleet owner buy dual-fuel vehicles, run them exclusively on gasoline, and still be in compliance with S. 570?

10(a) S. 570 applies to fleets of a certain size located in certain "metropolitan statistical areas." How would you determine whether a fleet is "located" in a covered

area? (i.e., by vehicle registration? by where the vehicle is garaged? by the normal business range of the vehicle?)

(b) Depending on how location is determined, could businesses simply move across the county line to escape the program?

FEDERAL FLEETS

11. At the hearing, there was some confusion over whether S. 570 would or would not require federal agencies to comply with the purchase requirements of section 712. Please state for the record:

(a) Whether section 712, by its terms, applies to the federal government; and

(b) Whether it is the Administration's intent that section 712 apply to the federal government.

12(a) How do the purchase requirements in S. 570 differ from those being considered by the Administration for application to the federal government by executive order?

(b) What is the status of the draft executive order?

OIL SAVINGS FROM ALTERNATIVE FUELS

13. Page 70 of the National Energy Strategy states that alternative fuels are expected to displace 2 million barrels of oil per day by 2010. But on page 7 and again on page 15 of Ms. Stunts's prepared statement, it is stated that alternative fuel fleets will save only 350 thousand barrels of oil per day by 2010. Please explain the difference between the two figures.

CAFE CREDIT FOR ALTERNATIVE FUEL VEHICLES

13. The National Energy Strategy speaks of the importance of the corporate average fuel economy (CAFE) credit given to auto makers as an incentive for making alternative fuel vehicles. The NES proposes eliminating the 1.2 miles per gallon cap on this credit. Section 701 of S. 570 appears to eliminate the credit entirely, not just the cap. What is intended?

QUESTIONS FROM SENATOR PETE V. DOMENICI

The definition of "alternative fuel" does not include "liquefied petroleum gas." As a matter of policy, is there a sound reason for its exclusion?

QUESTIONS FROM SENATOR MALCOLM WALLOP

1. In the Administration's NES fleet program there are three statistics regarding oil savings that do not seem to compute; they are——

Reduction	Cause
2,000,000 barrels/day	DOE-projected reductions from NES and Clean Air Act.
350,000 barrels/day	NES fleet program.
700,000 barrels/day	Clean Air Act fleet program.

Somehow, the last two numbers just do not add up to the first one. Could you explain the disparity in estimated oil consumption reductions?

2. Many fleet operators utilize central fueling in order to refuel efficiently. Efficient dispatching precludes them from having the option of going to a public filling station.

Establishing a typical central refueling station is expensive. For example, the cost is upwards of $600,000 for 100 fleet vehicles.

(a) What do you estimate are the costs for a typical fleet operator to comply with the NES fleet proposal?

(b) Does this estimate take into account the fact that many fleet operators must build and operate their own refueling facilities?

(c) Did you calculate a fuel premium or discount for an alternative fuel such as compressed natural gas?

3. I understand that the Administration considers it fleet proposal as an alternative to more stringent CAFE standards. The Administration's proposal is to expand on the alternative fuels provisions contained in the 1990 Clean Air Act Amend-

ments. However, this proposal is being made before the new Clean Air Act's alternative fuels and fleet programs has been implemented.

The Administration proposal would expand the Clean Air Act program both within these 22 areas to fleets of 10 or more vehicles and nation-wide to any fleet owners with 20 or more vehicles. Their expanded proposal would encompass approximately 130 cities, where two-thirds of all Americans live.

Common sense would suggest the advisability of some experience with the 22 nonattainment areas where public health was at risk before further intervention in the market place. By the expansion of this as yet untested program we may well jeopardize achievement of the very public health objectives sought by the Clean Air Act.

What analysis has the Administration made in this regard?

4. Won't opening up the Clean Air Act fleet program by enacting a massive nationwide fleet program just lead to greater uncertainty in the near term and a postponement of developing alternative fuel vehicles and the necessary infrastructure?

5. The Clean Air Act fleet program reflected a balance between mandatory and voluntary compliance, between vehicle manufacturers and purchasers, and between alternative fuel providers and users.

(a) In your view, does the NES reflect such a balance?

(b) Could you point to any examples in the proposed fleet program that support this view?

6. Does the National Energy Strategy consider propane and other natural gas liquids as an alternative fuels?

(a) DOE's current alternative fuels demonstration programs do not provide domestically produced natural gas liquids equal access to transportation markets as the program does for methanol, ethanol, natural gas and electricity.

Is there any basis for further continuing this disparity in the Administration's National Energy Strategy?

7. We understand that we will soon be importing liquefied natural gas (LNG) from abroad. How certain are you that there will be adequate alternative fuel supplies in this country?

8. I am concerned that before Federal policies expand the use of alternative fuels we need to fully understand the consequences for fuel producers, fuel marketers, the affected fleet operators, and public health and safety. Would you provide for the record the following information:

(a) For which alternative fuels does there already exists a distribution system and for which a system needs to be created?

(b) Which alternative fuels add to the weight of vehicles and thus affect safety?

(c) Which alternative fuels reduce the high standard of mobility on which our economy relies for the movement of people, goods and services?

(d) Which alternative fuels actually reduce energy efficiency by requiring more Btu's per mile driven?

(e) Which alternative fuels increase our dependence on foreign energy supplies? For example, if imported methanol is simply substituted for imported crude, very little is accomplished for national security.

9. In the Clean Air Act fleet program, conversion of existing vehicles are explicitly considered the same as purchases of new vehicles for the purpose of meeting acquisition requirements. The NES bill does not have a similar provision.

(a) Does DOE support a statutory provision that explicitly states that conversions are to receive equal credit to purchases for the purpose of meeting the acquisition requirements?

(b) If not, why not?

10. The printed version of the NES fleet program contains one page of incentive provisions related to credits, but more than four pages of civil and administrative penalty provisions. Don't you think this reflects misplaced priority in developing the program?

11. The Clean Air Act generally operates under the principle of "the polluter pays." Similarly, under CAFE regulations, the entire domestic auto manufacturing industry is affected. Likewise, the federal tax code makes gas guzzlers pay a penalty for their high fuel consumption. The NES, however, targets private sector commercial fleets even though their fuel efficiency suggests that they are not a clear source of the problem facing the Administration.

(a) Doesn't the record reflect that private sector fleets are more fuel conscious and efficient than the general public?

(b) Are you aware of any evidence to the contrary?

12. How essential were the incentives contained in the Clean Air Act fleet program to making it viable public policy?

AMERICAN TRUCKING ASSOCIATIONS,
Alexandria, VA, March 28, 1991.

Hon. J. BENNETT JOHNSTON,
Chairman, Committee on Energy and Natural Resources, U.S. Senate, Washington DC.

DEAR MR. CHAIRMAN: Thank you once again for the opportunity to testify last week on Title VII of S. 570, the alternative fuel fleet provisions of the National Energy Strategy. Your knowledge of the issue was obvious and your questions and comments were insightful. It was a pleasure to appear before the Committee on Energy and Natural Resources, and I hope that my testimony was helpful.

As you requested, I am submitting the enclosed reply to your questions regarding specific aspects of the alternative fuel fleet rule for the printed hearing record.

Please let me know if I can provide any further information.

Sincerely yours,

LANA R. BATTS,
Senior Vice President, Government Affairs.

[Attachments.]

REPLY TO QUESTIONS SUBMITTED BY SENATOR JOHNSTON

Question 1. The Administration's bill exempts "multi-unit trucks over 26,000 pounds gross vehicle weight" from the alternative fuel requirement.

What percentage of the nation's trucks qualify for that exemption?

Answer. According to the 1987 Trucking Inventory and Use Survey (TIUS), (U.S. Census Bureau), there were 1,068,600 combination vehicles operating in the U.S. This accounts for about 2.4% of all trucks.

A large majority of "multi-unit" trucks over 26,000 lbs. Gross Vehicle Weight Rating (GVWR), are used in inter-state line haul trucking applications. Since these vehicles would not qualify as being centrally fueled, they would not be included in the proposed fleet mandate in S. 570. Of those trucks over 26,000 lbs GVWR which are centrally fueled, a high percentage are "straight" trucks (truck cab and body on a single inseparable chassis), such as garbage trucks, dump trucks, beverage delivery, and specialty trucks.

Therefore, the exemption for "multi-unit" trucks over 26,000 lbs. GVWR offers little or no relief to centrally fueled fleets in this size range.

Question. Would enactment of S. 570 lead to trucking fleet owners relying more heavily on multi-unit trucks to avoid the alternative fuel requirement?

Answer. Yes. To some extent, fleets with both straight (single-unit) trucks and multi unit trucks would probably rely more heavily on multi-unit trucks. The choice of the size and configuration of vehicles used in commercial fleets is dictated by payload considerations, operational requirements and restrictions, fuel economy and overall performance.

However, the cost of utilizing existing equipment and fuels will be the determining factor. Even if multi-unit trucks would carry less than the maximum productive and customary load of the vehicle, it would still be far cheaper than to acquire, use and maintain unproven alternative fuels vehicles, and infrastructures as envisioned under the S. 570 mandate. Fleet owners may also consider extending the life of their vehicles in order to avoid the rigid mandate. Simply, the use of more multi-unit vehicles is a plausible reaction to an unreasonable and rigid mandate.

Question 2. In your prepared statement, you say that passenger vehicles and light-duty trucks are more suitable for use of alternative fuels than heavy-duty trucks.

Where do you draw the line between light-duty and heavy-duty trucks?

Answer. According to the Environmental Protection Agency, EPA, heavy-duty vehicles are defined as any vehicle over 8,500 pounds gross vehicle weight rating (gvwr); light-duty vehicles are less than 8,500 lbs gvwr, and generally commercial trucks fall in the range of 6,000–8,500. We believe EPA's weight classification scheme is the most appropriate, and that the NES should draw the line at the 8,500 lb mark.

Question. Should the "multi-unit truck over 26,000 pound" exemption be expanded to any truck over a certain weight?

Answer. Yes. There are many commercial trucks which, because of their cargo, payload and designs, could not reasonably use alternative fuels without major operational disruptions. For example, many straight trucks haul dense freight or refrigerated cargo, or bulk construction materials, bulk liquids, and other special commodities. These vehicles typically operate at or near weight and axle limits and could not readily use alternative fuels without substantially reducing payload and

redesigning of the vehicles. We also believe that any truck hauling hazardous materials should be exempted from the requirements regardless of the weight.

Question. What should that weight limit be?

Answer. The expansion of the weight-limit exemption should apply to all commercial trucks with gross vehicle weights of 8,500 lbs. and up. The majority of these vehicles are powered by diesel engines, the most efficient, economical, and durable power source available. If the goal of S. 570 is to assure energy self-sufficiency and conservation through the use of more efficient energy resources, the diesel engine is already the most efficient power source.

If however, the purpose of the legislation is to mandate the use of non-petroleum fuels in commercial fleets, then there are considerable technical and economic issues which must be considered.

During the hearing, several comments were made concerning certain school districts converting their buses to natural gas. Because these school buses were originally powered by spark-ignition, gasoline engines, their conversion to natural gas was not technically difficult.

However, these same school districts have not converted their diesel-powered buses to natural gas because such conversions would require substantial, costly engine redesign. Additionally, the loss of diesel fuel and technology efficiency would outweigh the advantages to switching to a cheaper fuel, ultimately resulting in higher operating costs.

Concerns about technology, fuel economy, durability, reliability, payload, axle weight, and engine performance have led the commercial trucking industry to urge the Committee to limit any mandated fuel program to vehicles below 8,500 lbs. gross vehicle weight.

APPENDIX II

Additional Material Submitted for the Record

PREAPRED STATEMENT OF RAYMOND A. LEWIS, PRESIDENT, AMERICAN METHANOL INSTITUTE

Mr. Chairman, Senator Wallop, and Members of the Committee, the American Methanol Institute represents companies that are now supplying the majority of the U.S. methanol requirements for both fuel and chemical applications. We look forward to working with you and your Committee to craft legislation to support the increased use of alternative fuels by utilizing the most equitable, cost-effective and practical provisions from your bill, the Administration bill, the Jeffords bill, and the Wirth bill.

Currently, the U.S. transportation sector is almost totally dependent on petroleum. The need for displacement of oil in the transportation sector is obvious. The diversely constituted U.S. Alternative Fuels Council, on which I serve with representatives from oil, auto, alternative fuels, state and local governments, and consumer and environmental interests, voted overwhelmingly (14–1) in December, 1990, to recommend that the nation displace 25 percent of transportation fuels with non-petroleum alternative fuels by 2005.

The American Methanol Institute would urge this Committee, as it develops its alternative fuels component for national energy security and strategy legislation, to evaluate proposals within the context of certain principles. These include the recognition that while domestic sources of renewable and non-renewable energy should be supported, complete "energy independence" is not achievable, and that "energy interdependence" through diversification of imports and expansion of international energy relationships is more realistic; the recognition that energy diversity, both among imports and domestic sources increases energy security; the recognition that the nation benefits most from those fuels which are cost-competitive without subsidies, or that subsidies should be equitably distributed among the competing non-petroleum alternative fuels; and the recognition that relative to existing gasoline and diesel there are substantial efficiency and air quality improvements obtainable from a range of alternative fuels.

Methanol is an unsubsidized and diversely available fuel which meets all of the above requirements. While the American Methanol Institute continues to be supportive of a competitive multi-alternative fuels national energy strategy, it is important to correct for the Committee's hearing record some serious misstatements about methanol made by representatives of competing fuel interests during the hearing on March 20, 1991.

For example, during the Committee hearing the Renewable Fuels Association stated that "Methanol is quite a toxic fuel, it is very low in Btu content. Virtually all of it is imported." This statement needs correction and clarification.

First, it is absolutely false and misleading to state that virtually all methanol is imported. In fact, currently about 72 percent of domestic methanol consumption is produced in the U.S., with Louisiana being a very significant methanol producing state. Together the U.S. and Canada supply almost 90 percent of U.S. methanol consumption. Total methanol imports to the U.S. from the Middle East represent less than 2 percent of U.S. consumption. Methanol fuels will provide both increased energy diversity and security while improving air quality. A recent industry survey of currently identified potential methanol projects, worldwide, indicates that 71 percent of methanol production growth will come from non-Middle East and non-Soviet sources. To the extent that fuel methanol is imported, it will function as a displacement for gasoline and crude oil imports and will help to greatly diversify our sources of transportation fuel. Fuel methanol imports, to the extent they do increase, will improve energy and national security through diversification of countries becoming energy partners with the U.S. Opportunities to increase the role of

friendly nations, particularly in the Western Hemisphere, as energy trading partners should be viewed as an energy security opportunity. (See attached tables)

Second, concerning the RFA statement that methanol is "quite a toxic fuel", context is important. Methanol is already in widespread domestic use, both as a 60 percent component of windshield washing fluid, and in neat form as an antifreeze. These consumer applications demonstrate that methanol can be used and handled safely in domestic use. But like all motor fuels, methanol is toxic to humans especially if swallowed. To prevent accidental ingestion, a bittertasting agent can be added to methanol fuel and anti-siphoning devices installed on methanol vehicles. The companies belonging to the American Methanol Institute have manufactured many billions of gallons of methanol distributed to thousands of customers around the world for decades. Handling methanol is well understood and does not represent an additional threat to public health and safety.

The highly respected Health Effects Institute in Cambridge, Massachusetts, chaired by Archibald Cox, completed in May 1987 what continues to serve as the most comprehensive study of the health effects of methanol vapor. The Health Effects Institute concluded that "exposure to methanol vapors is not likely to cause adverse health effects." In a statement from the Board of Directors, the Health Effects Institute concluded that:

> On balance, we believe that, given the anticipated uses of methanol as a motor vehicle fuel in the foreseeable future, the weight of available scientific evidence indicates that exposure to methanol vapors is not likely to cause adverse health effects. Health concerns regarding methanol vapor should not prevent government and industry from encouraging the development and use of methanol fuels, assuming that such development and use are otherwise in the public interest.

Third, concerning the Renewable Fuels Association's statement that methanol is very low in Btu content, a distinction needs to be made between Btu content and efficiency. Methanol has a lower energy per unit volume than gasoline, but a similar density. More volume is needed for a given quantity of energy to be delivered. However, relative to gasoline methanol is more energy efficient: 5% to 15% for M85 (the highest methanol concentration currently planned for flexible fuel vehicles) and up to 30% for M100 (neat methanol for dedicated vehicle use). These energy efficiency attributes of methanol are expected to improve with automotive engineering developments.

With regard to a statement made by the Natural Gas Vehicle Coalition at the hearing that methanol has "an emission problem", it is worth noting that the emissions benefits of methanol are among its attributes that have propelled it forward as an important air quality tool in the transportation sector.

Methanol vehicles emit less ozone-forming hydrocarbons, less NO_x, less particulates and fewers toxic compounds than their gasoline and diesel counterparts. Air quality benefits from the use of methanol range from dramatic pollution reduction for methanol in its pure M100 form to lesser but still substantial pollution reduction when methanol as a primary fuel is used in diluted form (M85) or as a blend or an additive to gasoline. The only readily formed products from partial combustion of methanol are carbon monoxide and formaldehyde. Both of these are recognized pollutants. Fortunately, they can be readily oxidized to harmless carbon dioxide and water by exhaust catalysts. California has regulated, with the full support of the methanol industry, formaldehyde emissions from M85 vehicles so that public exposure will be no greater than that from gasoline vehicles. It is now recognized that the majority of ambient formaldehyde is produced from oxidation of complex hydrocarbons stemming largely from gasoline and diesel exhausts.

While the methanol industry assumes that NO_x emissions from natural gas vehicles some day will be brought into compliance with the Clean Air Act of 1990, it should be noted that it is the methanol bus engine technology, not the CNG technology, which is expected to be the first alternative fuel to achieve certification under the 1990 Clean Air Act. Contrary to statements made during the March 20 hearing, it is methanol technology that is more advanced than CNG technology in meeting 1990 Clean Air Act requirements. It is important to note that the methanol industry assumes that CNG technology, although apparently about 1-2 years behind methanol technology, will be fully certified in the next few years. But, the Committee should not confuse the number of CNG demonstration vehicles on the nation's roads with vehicles that are certified to meet 1990 Clean Air Act requirements. A Booz, Allen & Hamilton, Inc. study just completed for the Sacramento Regional Transit District (March 11, 1991), entitled "Alternative Fuels and Facility Conversion Study", concludes that only methanol at this time meets all federal, state and local certification requirements.

The American Methanol Institute views methanol as a fuel which both complements and competes with ethanol, CNG and others as oil displacement alternative fuels. Unsubsidized methanol provides an essential legitimacy to alcohol fuels, which if limited to subsidized ethanol through market share guarantees and tax policies, would make the alcohol fuels option excessively expensive and thus limit its potential impact as an oil displacement and air quality tool. Methanol, while it surely competes with CNG for fuel and vehicle market share, is made most easily and inexpensively from natural gas. So methanol has a complementary feedstock relationship with natural gas that can provide significant economic opportunities for domestic U.S. methanol production and domestic natural gas. This is especially important for those domestic natural gas reserves whose characteristics make it attractive for methanol feedstock but unattractive for natural gas pipeline use. Two small decentralized methanol facilities in Colorado and Illinois, currently under construction, and others are expected to provide markets for more domestic natural gas in the next decades.

It is important to understand that methanol has the greatest range of oil displacement fuel applications. Unsubsidized methanol will probably become the nation's most important alternative transportation fuel building block. It will play an important role in the heavy duty vehicle sector through buses and trucks. It will be a key fuel in the school bus market. In the light duty sector it will fuel dedicated M100 vehicles, M85 flexible fuel vehicles and compete as a blend and additive for use in improving the existing gasoline pool. Methanol also has the potential to be the most important fuel to promote the development of fuel cells. The Electric Power Research Institute has also recognized its potential in power plant applications.

Finally, methanol has a diverse range of feedstock sources. Today, methanol is most economically produced from natural gas. But, methanol can be an important recycling tool using garbage as its feedstock. And research at the Solar Energy Research Institute (SERI) in Colorado, is already demonstrating that methanol from biomass is as viable a renewable fuels option as biomass for ethanol. We fully anticipate that during the next two decades methanol will be a significant renewable fuel.

We look forward to working with you and your staffs in the coming weeks and months to develop legislation which assures equitable competition among the alternative fuels, free of costly market distorting subsidies. Legislation is needed to encourage strong, predictable and long-term demand growth for those alternative fuels which can best contribute to our twin goals of improved air quality and enhanced energy security through domestic and international energy diversity.

[Attachments.]

Methanol: A Domestic Resource

Recent developments in the Middle East have raised questions about methanol suppliers. This fact sheet responds to those concerns.

The U.S. is by far the largest supplier of domestic methanol. Together, the United States and Canada, our closest North American trading partner with whom we enjoy a preferential trading agreement, supply nearly 90 percent of U.S. methanol consumption.

Methanol fuels will provide energy diversity and security. A projection of currently identified potential methanol projects indicate 71 percent of growth will come from non-Middle East or Russian sources.

METHANOL STATISTICS, 1989

	Millions of gallons	Percent
U.S. consumption	1,610	
U.S. production	1,164	72
U.S. imports	428	27
Canada	245	
Trinidad	64	
Malaysia	39	
Chile	28	
Bahrain [1]	24	
New Zealand	21	
Saudi Arabia [1]	6	
Others	1	
U.S. exports	33	(2)
Inventory change	(51)	3

[1] Total imports from Middle East sources below 2% of consumption.

Source: Crocco & Associates, Inc.

PROPOSED METHANOL PROJECTS BY LOCATION

Other countries		Middle East and Eastern Bloc	
Location	Capacity (million gal/yr)	Location	Capacity (million gal/yr)
New Zealand	133	USSR	50
New Zealand	133	Saudi Arabia	220
United States	83	Oman	233
United States	25	USSR	133
United States	33	Bulgaria	67
Venezuela	183	Iran	28
Venezuela	200	UAE	167
New Zealand	133	USSR	200
Trinidad	183	Bulgaria	133
Venezuela	233	UAE	267
Malaysia	200		
United States	167		
Argentina	250		
New Zealand	133		
Norway	250		
Trinidad	242		
China	67		
Latin America	233		
Brazil	200		
Mexico	250		
Argentina	217		
Indonesia	133		
Total gals/yr (millions)	3,681		1,498
Total barrels/day (thousands)	240		98
Total (percentage)	71		29

PREPARED STATEMENT OF ENGINE MANUFACTURERS ASSOCIATION

The 27 companies comprising the Engine Manufacturers Association represent the major worldwide manufacturers of commercial engines used in applications ranging from grounds care to heavy-duty on-highway trucks and buses. These heavy-duty engines and the vehicles and equipment they power would be directly

and extensively affected by the alternative fuels proposals in the Bush Administration's National Energy Strategy legislation.

Title VII of that legislation would require fleets of 10 or more heavy-duty vehicles in metropolitan areas with populations over 250,000 to phase in purchases of vehicles using alternative fuels such as methanol, ethanol, or natural gas beginning with 10% of fleet purchases in 1995 and going up to 90% of purchases in 2000 and thereafter. Conventional fuels such as diesel would not qualify regardless of fuel efficiency or emission performance, nor would the potential economic penalties to heavy-duty vehicle users be taken into account.

To those of us who participated in the extensive consideration of alternative fuels requirements for fleet vehicles during the reauthorization of the Clean Air Act, the Administration's proposal for mandatory use of alternative fuels in vehicles is all too familiar. A similar proposal was included in President Bush's original Clean Air legislative package. Like that proposal, it flies in the face of the stated philosophical approach of the Bush Administration, which is to rely on market forces and to balance economic, environmental and energy security objectives. That is, instead of relying on economic incentives to steer vehicle users toward alternative fuels, it uses a "command and control" approach that overrides and ignores the realities of the marketplace.

During the consideration of the Clean Air Act, the mandated approach was discussed extensively by the Congress. Ultimately, the mandatory use of alternative fuels in heavy-duty commercial vehicles was rejected because it offered little environmental benefit over state-of-the-art diesel technologies, because it would seriously strain the finances of already weakened manufacturers, and because it would impose significant operating penalties on our customers.

For all of these reasons, Congress opted to include diesel fuel in the definition of alternative fuels in the Clean Air Act. This "fuel-neutral" approach in the Clean Air Act program allows owners of fleets of heavy-duty vehicles to choose the fuel that best matches their particular operational requirements and fuel cost and availability circumstances, while still requiring clean-fuel fleet vehicles to have significantly lower emissions than other fleet vehicles and non-fleet vehicles.

It should be emphasized that the Engine Manufacturers Association does not oppose the use of alternative fuels in heavy-duty applications where the use of alternative fuels rather than diesel fuel would make operational and economic sense to our customers. EMA members are working hard to develop durable and reliable heavy-duty engines using alternative fuels such as methanol and compressed natural gas to respond to demand for such engines in certain applications and in certain geographic areas. We are undertaking this work simultaneously with the massive development and retooling required to redesign our diesel engines to meet the stringent 1991, 1994, and 1998 federal emission standards already in place.

Rather than requiring our customers to use alternative fuels regardless of the cost or suitability of those fuels for their particular operating circumstances, we believe the proper role of government is to encourage the development of heavy-duty alternative fuel engines and vehicles, for example through appropriate incentives. EMA strongly supported the Alternative Motor Fuels Act of 1988 and EMA members either are participating in or hope to participate in the heavy-duty vehicle demonstration programs funded by that legislation. Similarly, we support the provisions of several bills before the Committee which provide for government assistance in the development and commercialization of technologies for use of alternative fuels in transportation, especially if at least some of those resources are devoted to work on heavy-duty engines and vehicles.

Because of the high energy efficiency of the diesel engine, the relatively high cost of alternative fuels, and the combined impact of these two factors, mandating the use of alternative fuels in most heavy-duty fleets will impose major new costs on the system that moves our nation's goods. Vehicle operators forced to purchase alternative-fueled vehicles when such purchases do not make economic sense will simply pass on the increased cost of purchasing and operating these vehicles to their customers. In the end, these costs will be borne by all of the nation's consumers.

Ironically, market forces by themselves are already pushing heavy-duty vehicle operators in the direction of greater fuel efficiency and conservation. The deregulation of trucking and the premium placed on lower operating costs in all applications have made the energy-efficient diesel engine increasingly popular in applications once dominated by the gasoline engine. And, when compared to engines using non-petroleum-based alternative fuels, diesels retain their energy-efficiency advantage.

Finally, the benefits of a mandatory program, in terms of reducing our nation's petroleum consumption, would be minimal. While some studies show that truck miles traveled have increased in recent years, on-highway diesel fuel still represents

only 7% of total U.S. refined petroleum products. By contrast, gasoline represents about 45% of total refined petroleum products. In addition, on-highway diesel fuel represents less than half Of the demand for #2 distillate products.

The members of the Engine Manufacturers Association are committed to providing fuel-efficient, environmentally responsible products to meet the needs of the nation's heavy-duty vehicle fleet. Those needs vary greatly from application to application and from place to place. Eliminating one energy-efficient option—i.e. the diesel-fueled engine—in the name of energy conservation is neither good energy policy nor good environmental policy.

PREPARED STATEMENT OF ROBERT E. MYERS, PRESIDENT, LP GAS CLEAN FUELS COALITION

The LP Gas Clean Fuels Coalition welcomes the opportunity to present these comments regarding the use of alternative fuels. The Coalition's membership is a cross section of the entire LPG industry consisting of producers of oil and gas, retailers, equipment manufacturers, storage and transportation operators in addition to various associations and concerned individuals. The Coalition's focus is to enhance the use of LPG (propane and butane) in various energy sectors impacted by environmental and energy security legislation and regulation.

LPG was an "alternative fuel" to gasoline and diesel long before the phrase became popular. Some 350,000 vehicles using LPG now operate on our highways and even more industrial trucks currently are powered with LPG. World wide, 3.8 million vehicles use LPG. Most vehicles in the U.S. use mono-fuel systems where the gasoline fuel system is replaced (not operated as dual fuel) with LPG equipment. This technology has evolved since the 1920's.

The following comments with attached exhibits are offered in response to specific questions posed by staff. Some questions are beyond the scope of our immediate concern or expertise in which case we defer to others. However, we wish to stress that LPG can play a key role in both energy security and environmental improvement. Eighty percent of current use is produced in the U.S. with the majority of the remainder coming from Canada. About 60% is a derivative of natural gas production, 40% from crude oil refining.

The role for LPG is uniquely suited for fleets. The issue of the best alternative for general passenger cars is the subject of long and acrimonious debate. We favor nor advocate any one fuel for this market. It seems all fuels may have a place as technology evolves and infrastructure develops. What we do advocate is equal access to all markets by all fuels with the marketplace the final arbiter. Such is not now the case because of biases of policy makers. Objectivity and equity are sound principles that should be the root of any policy or legislation. It is likely mandates will be required to effect implementation of any alternative motor fuel.

VEHICLE AVAILABILITY

The vehicles for LPG can be available if production incentives were available to the manufacturers as is now the case for alcohol fuels and natural gas. Ford, GM and Chrysler have all at one time produced LPG vehicles. Only Ford now produces LPG vehicles in the medium and light duty engine sizes. However, the point is the capability exists. Further, NES legislation and policy should address the potential of accelerating provisions of the CAA by including retrofits. LPG equipment manufacturers state production capacity is now in place for 200,000 annual retrofits.

FUEL AVAILABILITY

Previous lack of solid data on LPG availability resulted in DOE dismissing LPG as having any significant role in the NES. However, recent work by Purvin and Gertz concludes that adequate supplies are available from North American sources to fuel 9–11 million vehicles, or every fleet vehicle in the U.S. Even more recent work by R.F. Webb Corporation indicates adequate supply by 1995 to propel 13.3 million vehicles escalating to 21.4 million vehicles by 2005.

Both of these studies use methodology used in the assessment of other alternative fuels. Summaries of these two studies are attached.

A broad based alternative motor fuel demand will, by necessity, expand the large infrastructure already in place. This will ameliorate some of the temporary transportation problems encountered recently as a result of severe weather. As year round demand increases more storage will be in place in the immediate markets relieving some of the pressure points experienced by pipelines, rail cars and trucks.

In addition, steady demand results in more productive use of assets thereby allowing economies of scale and lower costs.

FUEL PERFORMANCE

With more than 350,000 LPG vehicles on the road in the U.S. encompassing more than 60 years of experience, it's obvious the fuel delivers satisfactory performance. In fact, LPG is the only alternative fuel with such a record. Without satisfactory performance no fuel will be successful regardless of mandates or incentives. This is one area where uncertainty doesn't exist.

DISTRIBUTION SYSTEM

The infrastructure for LPG is more elaborate and advanced than any other alternative fuel. In the U.S. there are 70,000 miles of pipeline capable of handling LPG, 22,000 rail cars, and more than 20,000 delivery trucks. Product is moved to the market from 9 billion gallons of storage. Some 25,000 dealers are already in place, 10,000 of which already have the capability of dispensing automotive LPG although a portion of these facilities need to be upgraded to provide the same level of convenience customers are accustomed to. Detail of this infrastructure is attached.

IMPACT ON FLEETS

Alternative fuels will result in additional capital costs for (1) the vehicle itself, (2) fuel storage and (3) possibly modifications to a customer's facility.

Operational costs may increase as a result of additional personnel training, use permits and in some cases insurance. However, in the case of LPG fuel handling training is provided by the fuel supplier, local permitting fees are generally reasonable and most insurance companies, long familiar with LPG, exact no additional premium for LPG use.

Based on years of experience there is no problem in disposing of an LPG vehicle when its useful life in a fleet has been reached. In fact, due to the mandates in the 1990 CAA amendments, as well as California fleet mandates, we see a ready market for used vehicles.

INCENTIVES

Every major alternative fuel program in the world has taken incentives to stimulate usage.

Incentives should apply both to the purchase cost of a new vehicle as well as operating costs (fuel). A combination of these two will insure not only that new vehicles are purchased but the operator will continue to use the fuel and not switch back to gasoline. In the case of LPG and CNG this can be driven by greater incentives for dedicated fuel (i.e., no capability of an alternative fuel) than for a dual fuel vehicle. Then incentives must be in place to insure the benefits will continue over the operation life of the vehicle. One approach is a moratorium on federal motor fuel tax for a period of 5 years (apply to all alternative fuels).

For new vehicle purchases, a credit against income tax of, say 50% for a qualified new vehicle would stimulate purchase as long as the operational incentive is also in place. An investment tax credit is also viable.

To stimulate conversions of existing vehicles a "pool" could be established by the federal government to fund conversions. From savings experienced from the fuel cost differential, the "borrower" then repays the pool. Such a plan is now in effect in Oklahoma.

GUINEA PIG ROLE

It is essential that the government take the lead role in promoting the use of alternative fuels. It is equally essential that all fuels have equal opportunity which is not now the case as a result of interpretation of the provisions of the Alternative Motor Fuel Act of 1988. The government has the authority to take this leadership role but must be scrupulous in showing no bias for one fuel over another.

CALIFORNIA MANDATE

Because of the limitations of CAFE Credits applying only to passenger vehicles, it is essential to open up these credits to light and medium duty vehicles. Many commercial vehicles, which consume large quantities of fuel, are candidates for immedi-

ate use of alternative fuels if CAFE Credits were available to manufacturers for production of light duty and medium duty vehicles.

CHANGING CONSUMER BEHAVIOR

The Canadians have studied how much of a cost break is required before consumers will switch from gasoline to another fuel. An issue is the cost of the fuel and/or operating the vehicle. It appears in the Canadian studies that around 40% lower fuel costs, assuming everything else is equal, is required before a significant shift in the market occurs. In the Netherlands, the difference between gasoline and LPG prices is 50%, consisting primarily of gasoline taxes. So the Dutch have made it a policy goal to shift fuel use to LPG, by adjusting taxes as incentives. LPG now makes up 20% of the transportation fuels market. (Ref: Testimony before US Alternative Fuels Council, Nov. 15, 1990, Philadelphia, pg. 263)

FLEET MANDATES

We are very sympathetic to the concerns of fleet operators since many of the alternative fuels are unproven in fleet operations. However, such is not the case with LPG. With 60 years of satisfactory performance we feel any inhibitions that might arise can be easily overcome. However, support from the vehicle manufacturers is essential as most LPG vehicles currently operating have been retrofitted. Warranty, service, parts availability and training are essential to fleet operators. Access to the O.E.M.'s entire dealer network is possible only if the vehicles are factory equipped. Therefore, CAFE credits for LPG comparable to the other fuels must be provided.

THE FALLACY OF LIMITING CAFE CREDITS TO ALCOHOL FUELS AND NATURAL GAS

The "alcohol" fuels, ethanol and methanol, were presumed to be favored because some are renewable and domestically produced. Yet, it is generally conceded that ethanol will never be a competitive motor fuel without the federal subsidy. Even former Agriculture Secretary Clayton Yeutter notes that ethanol is not economically feasible today without economic subsidies.

Methanol can be produced from a variety of sources but the most economical source is natural gas. Current DOE policy is based on allegedly cheap natural gas offshore. While this may reduce the demand for imported oil, it is unlikely that it will enhance energy security very much since 76% of known natural gas reserves are controlled either by OPEC or USSR. Further, it is folly to assume that methanol plants located in foreign countries provide much security since foreign producers of oil and natural gas have a history of nationalizing any foreign investments if it suits them.

To put the transportation sector of the U.S. at the mercy of foreign owned reserves and presumably foreign owned methanol plants makes little sense. A much better alternative is to import the natural gas as LNG where (1) the added value will inure to U.S. companies and (2) provide the opportunity to do whatever we wish with it once it's in the U.S. The flexibility to inject it in the natural gas grid, power electric plants, make fertilizer or methanol is then our option. Foreign owned methanol plants have but one market—the U.S. transportation sector. Once that market is developed the price will rise to a level of oil only we won't control the supply or the price.

NEW TECHNOLOGY

While research has been done, more is needed on direct synthesization of LP Gas from natural gas. This is an alternative not previously considered. Technology exists today to convert natural gas to gasoline. This has been demonstrated initially in New Zealand. With further R&D it is believed that this technology can be refined to produce LPG. It could also open up the market for coal to LPG with greater energy efficiencies than conversion to methanol (for both natural gas and coal).

We greatly appreciate the opportunity to present these brief comments and invite your detailed review of the attachments. Further, we would be happy to provide any information in response to any questions.

[Attachment.]

SUMMARY OF TESTIMONY OF THE LP GAS CLEAN FUELS COALITION

LPG (PROPANE) AVAILABILITY

Strengthens environmental and energy security strategies through:

Supply to fuel all fleet vehicles now in the U.S. or 9–11 million vehicles; 13 million in 1995; and 21 million by 2005. Use as transition fuel in fulfilling Clean Air mandates.

Existing infrastructure of:

25,000 retail outlets, 10,000 with transportation fuel dispensing capabilities; 9 billion gal. of storage;

70,000 miles of pipeline; 22,000 rail cars;

80% domestic-produced supply; imports primarily from Canada.

VEHICLE AVAILABILITY

Capability exists now for vehicle manufacturers to produce LPG dedicated vehicles, if production incentives are expanded for LPG vehicles, similar to CAFE credits available to alcohol and CNG.

IMPACT ON FLEETS

Alternative fueled vehicles entail additional capital costs for the vehicle, fuel storage, and modifications to retailer's facility. Operation costs too could increase because of need for additional personnel training; use permits and insurance. In LPG's case, suppliers provide fuel handling training as part of conversion package or new facility.

Used LPG vehicles should be in demand especially in California, given CAA pilot program mandates.

Service, parts, warranties, training are important to fleet operators. Factory-equipped (dedicated) vehicles are serviceable through dealer networks; therefore, CAFE credits for LPG vehicles, comparable to other fuels, is critical to increase production of LPG vehicles for fleet purchase.

INCENTIVES SHOULD

Apply to dedicated LPG–CNG vehicles, including CAFE credits for light and medium duty vehicles, and should be maintained during operational life of vehicle (limits dependency on regular fuel with Flexible Fueled Vehicles).

Apply to purchase and operating cost of new vehicle.

Consider: 50-credit against income tax for vehicle purchase; Federal "pool" to fund conversions of existing vehicles; Borrower repays from savings from fuel cost differential as in Oklahoma.

Be applied equally to all fuels, including R&D and commercialization programs; e.g., need amend Alternative Motor Fuels Act of 1988.

○